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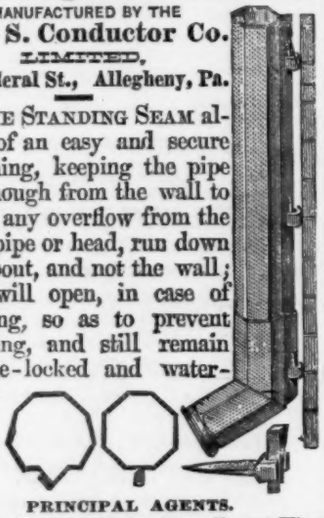

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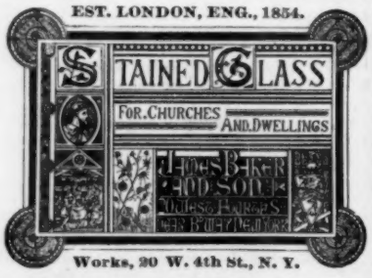

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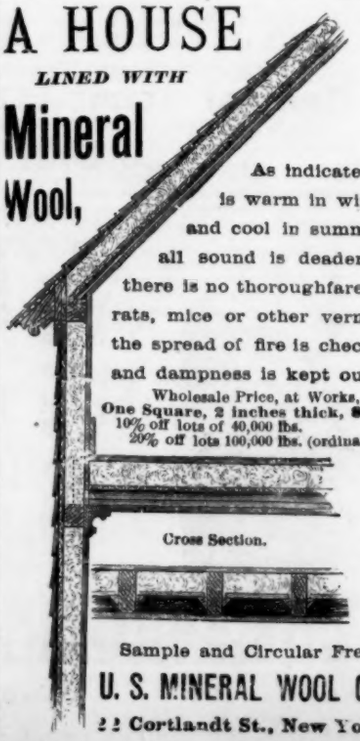

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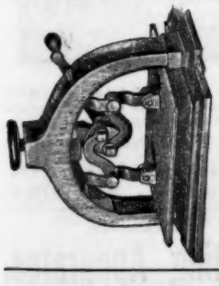

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Cash Capital	$1,000,000.00
Reserve for Re-insurance	635,741.16
Reserve for all other Liabilities,	96,655.57
Net Surplus	832,744.56
Total Assets, January 1, 1883	2,565,141.29

BUILDING MATERIALS.

Reported for the American Architect and Building News.

BRICK.—₱ M.	New York. (*Wholesale Prices.*)	Boston. (*Prices to Builders and Contractors.*)	Chicago. (*Prices to Builders and Contractors.*)	Philadelphia. (*Prices to Builders and Contractors.*)
Common: *Cargo afloat.*				
Pale	$2 25 @ $3 50	Eastern	Building Brick	Hard
Jersey	4 50 @ 5 50	7 50 @ 8 00	6 50 @ 7 50	8 00 @ 8 50
		Bay State Hard		Salmon
Up River	5 50 @ 6 00	9 00		5 00 @ 6 00
Haverstraw Bay	5 75 @ 6 25	Domestic Com.	Indiana Pressed	Stretchers
" 1st	6 25 @ 6 50	8 00 @ 9 00	16 00 @ 28 00	11 00 @ 14 00
		Domestic Face	St. Louis Fronts	Pressed
Fronts:		@ 18 00	25 00 @ 30 00	20 00 @ 24 00
Croton, Brown	13 @ 14 00	Philadelphia		
" dark	14 @ 15 00	40 00 @ 45 00		
" red	14 @ 15 00	Phila. mould		
Chicago pressed		50 00 @ 80 00	22 00 @ 35 00	
Chicago Moulded			65 00 @ 350 00	
Baltimore	37 @ 41 00		50 00 @	
Glens Falls—white	30 @ 35 00	Glens Falls		
Philadelphia	@ 27 00	25 00 @ 26 00	42 00 @	
Trenton	@ 27 00		40 00 @	
Milwaukee		Glens Falls	25 00 @	
Moulded:		Mould.	60 00 @ 100 00	
Clark's Glens Falls—Red	25 00 @ 27 00	30 00 @ 35 00	30 @	
" —White	30 00 @ 35 00	35 00 @ 40 00	35 @	
White " Mold	45 00 @ 60 00	45 00 @ 60 00	55 00 @ 65 00	
Enamelled: *Imp.*				
Enamelled (edge.)	85 00 @ 100 00	@	@ 100 00	Dom. @ 70
Enamelled (edge and end)	90 00 @ 115 00	@	@ 125 00	@ 85
CEMENT, LIME, etc.—(₱ *cask.*)				
Chicago Lime in bulk			65 @ 75	
Wisconsin "			80 @ 90	
Rosendale Cement	80 @ 90	@ 1 50	*Not Sold.*	1 25 @ 1 65
Utica, Akron, Buffalo, Louisville, Milwaukee	*Not sold.*	*Not sold.*	1 00 @ 1 25	*Not sold.*
Portland (English)	2 60 @ 3 10	@ 3 20	2 75 @ 3 00	2 30 @ 3 50
" (Saylor's Am.)	2 05 @ 2 40	2 50 @ 3 00	2 75 @ 3 00	2 50 @ 3 00
" (Dyckerhoff)	2 75 @ 3 15	3 00 @ 3 50	3 25 @ 3 75	3 00 @ 3 25
" (Lafarge)	3 50 @ 3 75	*Not sold.*	3 75 @ 4 25	4 50 @
" (Star)	2 75 @ 3 00	*Not sold.*	*Not sold.*	*Not sold.*
K. B. & S. (Eng.) Portland	2 85 @ 3 10		3 35 @ 3 50	3 00 @ 3 25
Burham " "	2 60 @ 2 80		3 15 @ 3 35	2 75 @ 3 00
Vorwohler	2 65 @ 3 25		3 00 @ 3 25	
German (Fewer)	2 50 @ 2 70	3 15 @ 3 35	3 15 @ 3 35	
" (Alsen)	2 50 @ 2 80	3 00 @ 3 50	3 15 @ 3 35	2 90 @ 3 25
Selenitic		1 65	*Not sold.*	
Hydraulic Lime of Teil	3 50 @ 4 00		*Not sold.*	
Roman	2 75 @ 3 00	@ 3 20	2 75 @ 3 25	3 25 @ 3 50
Keene's coarse	5 00 @ 6 00	@ 7 50	7 50 @ 9 00	6 50 @ 7 00
" fine	9 25 @ 10 25	@ 11 50	11 00 @ 12 50	11 50 @ 12 00
Lime:				
Rockland and Rockport, (Com.)	@ 95	@ 1 10	*Not sold.*	1 00 @ 1 25
Rockland and Rockport, finish	@ 1 15	@ 1 15	*Not sold.*	
State, com. cargo rates (nom.)	75 @ 80	*Not sold.*	*Not sold.*	*Not sold.*
State, finishing "	@ 1 00	*Not sold.*	*Not sold.*	*Not sold.*
Plaster of Paris (calcined.)	1 30 @ 1 35	1 70 @ 1 90	@ 1 75	1 60 @ 2 25
" (casting)	1 50 @ 1 65	@ 2 25	@ 2 00	2 25 @ 2 50
Hair (Cattle) ₱ *bush*	21 @ 25	25 @ 30	30 @ 35	22 @ 30
" (Goat)	32 @ 35	@ 30	35 @ 40	@
Sand, ₱ *load*	1 00 @ 1 25	@ 1 50	100 @ 1 25	75 @ 1 50
STONE. (₱ *cubic foot, rough.*)				
Granite: (*Maine*)		@ 60		
Limestone:				
Bedford	@ 1 00	95 @ 1 00	50 @	3 75 @
Joliet	@		35 @ 55	
Lemont	@		35 @ 60	
Serpentine	@		80 @ 90	

(*Continued on page vi.*

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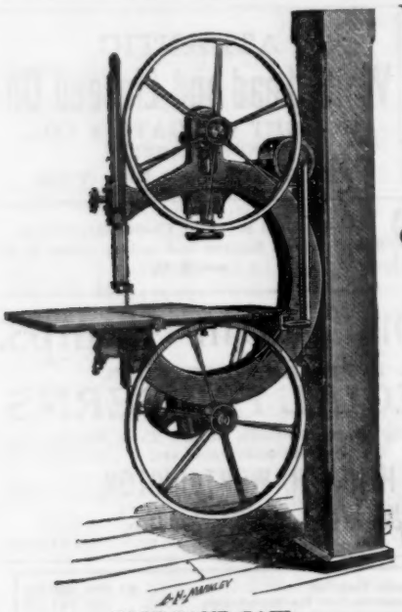

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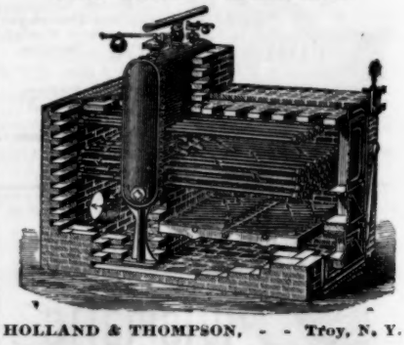

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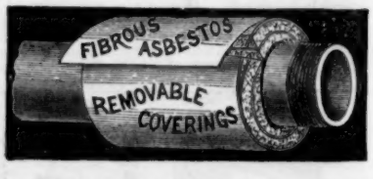

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Foundation:				
Dimension	@	5 00 ℔ ton	20 @ 28	30 @ 5 00
Block	@	4 60 ℔ perch	8 50 ℔ cord.	50 @ 6 00
Rubble	@	1 25 @ 1 50	8 50 @	
Bluestone: (℔ *sq. ft.*)				
Sidewalk	30 @ 5 00	@ 40	75 @ 1 00	70 @ 90
Planed	50 @ 6 00		50 @ 1 00	1 10 @ 1 25
Sandstone,				
Brown (Connecticut)	1 00 @	1 25 @ 1 45	1 50 ℔ cub.ft.	
Amherst	1 00 @	85 @ 95	55 @ 65	
Berea	75 @ 1 00	80 @ 90	45 @ 55	70 @ 90
Berlin	75 @ 1 00	80 @ 90	55 @ 65	
Bay of Fundy	@ 1 00	*Not sold*	*Not sold.*	
Belleville	80 @ 1 25	1 25 @ 1 35	"	
New Brunswick	@ 1 00	90 @ 1 00	"	
Caen	@	@ 2 00	"	
LUMBER.—℔ M. (*Ordinary dimensions.*)				
Boards:				
Pine, 1st quality, clear	65 00 @ 75 00	50 00 @ 53 00	47 00 @ 49 00	
" 2d quality	55 00 @ 60 00	42 00 @ 44 00	42 00 @ 47 00	
" 3d quality	18 00 @ 22 00	35 00 @ 38 00	41 00 @ 45 00	
Spruce	@ 25 00	11 00 @ 12 50	*Not sold.*	
Hemlock	ea. 17 @ 18	12 00 @ 12 50	@ 10 00	11 50 @ 15 00
Yellow pine	20 @ 40	30 00 @ 33 00	@ 28 00	16 00 @ 18 50
Clapboards:				
Pine	@	33 00 @ 35 00	14 00 @ 22 00	—@—
Spruce	@	23 00 @ 30 00	*Not sold.*	—@—
Framing Timber:				
Pine			13 00 @ 15 50	25 00 @ 35 00
Spruce	14 00 @ 18 00	13 50 @ 14 50	*Not sold.*	18 50 @ 20 00
Hemlock	12 00 @ 15 00	@	13 00 @ 19 00	12 00 @ 13 00
Yellow pine	20 00 @ 30 00	21 00 @ 25 00		22 00 @ 24 00
Laths:				
Pine	@	2 00 @ 2 25	2 25 @	—@—
Spruce	@ 2 25	2 00 @ 2 25	*Not sold.*	2 40 @ 2 60
Shingles:				
Pine, shaved	5 00 @ 6 00	@	*Not sold.*	
Pine, sawed	4 00 @ 5 00	@ 4 50	2 25 @ 2 60	
Spruce, sawed	2 50 @ 2 75	@ 1 50	*Not sold.*	
Redwood	2 10 @	@ 3 00	5 50 @ 8 00	30" $10 @ 28
Cedar, split	@	@	*Not sold.*	24" 8 @ 21
Cedar, sawed	@	2 00 @ 3 50	@ 2 30	20" 5 50 @ 14
Cypress.....7 x 24	18 00 @ 20 00	5 50 @ 6 00	*Not sold.*	16 00 @ 20 00
Miscellaneous:				
Piles.....℔ ft.	4½ @ 6	Piles 6c. ℔ ft.	*Not sold.*	
Fence pickets, Spruce	8 00 @ 10 00	10 00 @ 18 00	Pine, 8 @ 22	12 00 @ 14 00
Cedar posts, 9 ft. (sq. posts.)	@	25 @ 35	9 00 @ 21 00	70 @ 1 25
Chestnut "	@	25 @ 35	*Not sold.*	28 @ 36
Finishing Woods: ℔ M. *First Quality, Kiln-dried.)*				
Ash	@ 55 00	38 00 @ 48 00	35 00 @ 40 00	
Cherry	80 00 @ 120 00	60 00 @ 85 00	75 00 @ 85 00	55 00 @ 65 00
Chestnut	@ 55 00	38 00 @ 50 00	45 00 @ 50 00	60 00 @ 80 00
Butternut	40 00 @ 60 00	60 00 @ 70 00	45 00 @ 60 00	55 00 @ 65 00
Mahogany, Baywood	@180 00	100 00 @ 150 00	175 00 @ 180 00	100 00 @
" St. Domingo	@350 00	180 00 @ 250 00	250 00 @ 300 00	
Maple	45 00 @ 50 00	45 00 @ 65 00	30 00 @ 35 00	30 00 @ 50 00
Oak, red	@ 70 00	@ 50 00	35 00 @ 40 00	35 00 @ 45 00
" white	@ 70 00	@ 55 00	35 00 @ 40 00	55 00 @ 65 00
" quartered	@ 90 00	65 00 @ 70 00	50 00 @ 55 00	70 00 @ 80 00
Pine, clear	65 00 @ 70 00	50 00 @ 65 00	45 00 @ 50 00	65 00 @ 90 00
Redwood	70 00 @ 75 00	60 00 @ 70 00	60 00 @ 70 00	100 00 @
Rosewood.....℔ ℔	@ 6		@ 7	
Walnut, black	125 00 @150 00	85 00 @ 100 00	85 00 @ 100 00	160 00 @200 00
Whitewood	45 00 @ 50 00	40 00 @ 45 00	32 00 @ 35 00	20 00 @ 30 00
Yellow pine.....℔ M	@ 45 00	40 00 @ 45 00	32 00 @ 35 00	30 00 @ 35 00
Gumwood, best red			30 00 @ 35 00	

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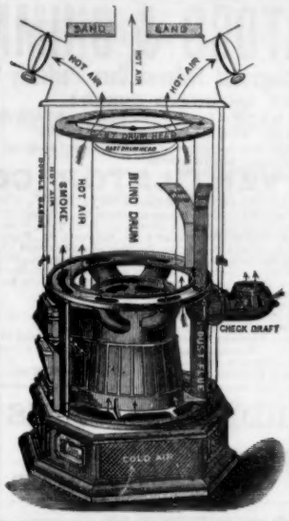

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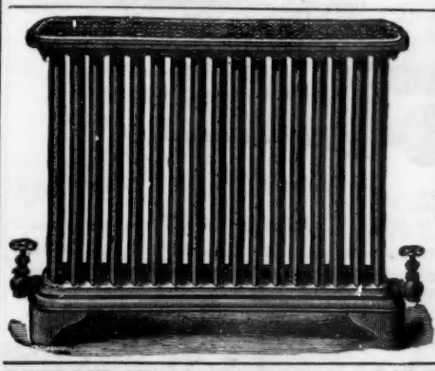

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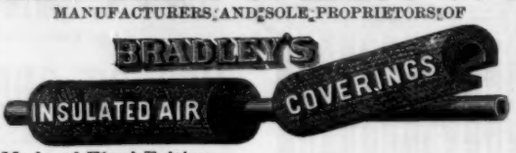

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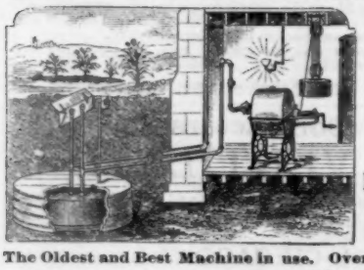

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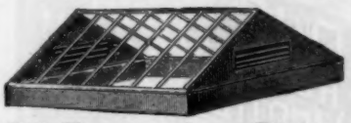

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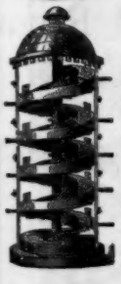

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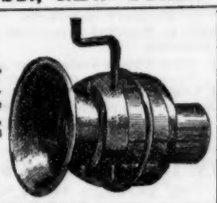

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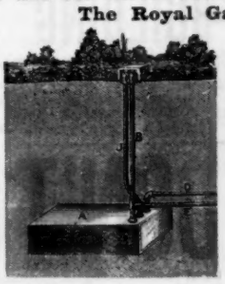

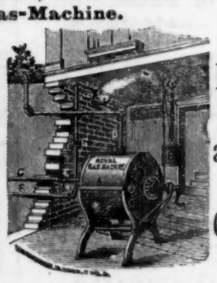

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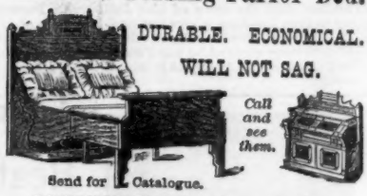

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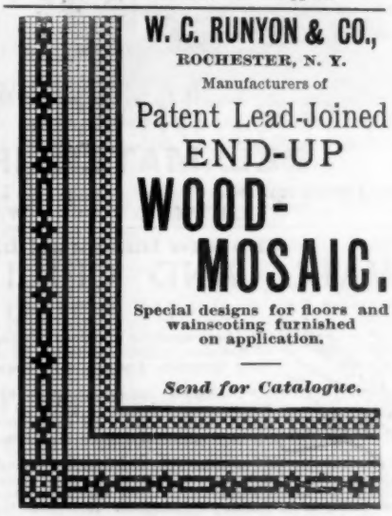

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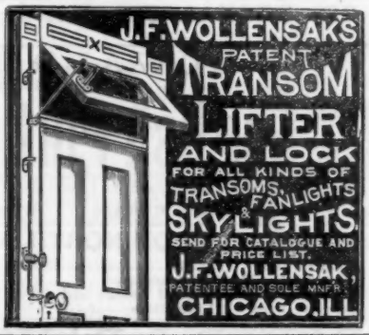

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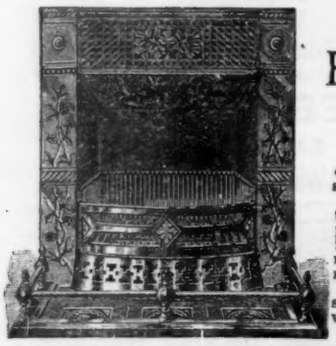

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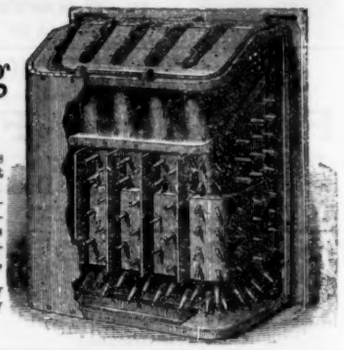

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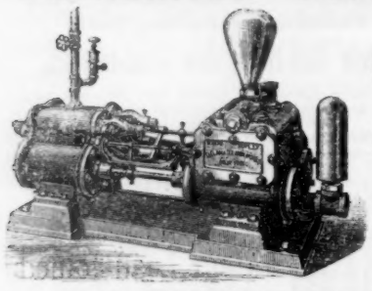

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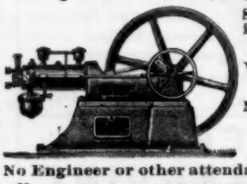

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AUGUST 30, 1884.

Entered at the Post-Office at Boston as second-class matter.

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THE *Inland Architect and Builder* announces a call for a convention of Western architects, to meet at Chicago on the second Wednesday in November next. The invitation is addressed to all members of the profession in the country, but is more particularly intended for those of the South and West, who find it difficult to avail themselves of the advantages of the meetings of the American Institute of Architects, and yet need, and know that they need, the help of association with others of the profession. Within a few years, under the federal constitution of the Institute, a considerable number of local societies and chapters have been formed west of the Alleghanies, but it is a long distance from Indianapolis or St. Paul to Albany or Newport, and the benefits resulting from the mutual acquaintance and support of a large body of the profession must almost necessarily be sought in such conventions as that which is now proposed. We trust that the response to the invitation will be general, and are sure that the Western convention will have the best wishes of all architects in the East, and, unless the invitation should be made less general, some of them are not unlikely to make an effort to express in person their fraternal sentiments.

WE believe we have not often been tempted to enter into a discussion or controversy with another journal, but we feel that circumstances justified us in "naming," as it were, the *Sanitary Engineer* for its treatment of Mr. Putnam. And as the matter of trap-ventilation is one of great importance to the public we feel there is reason for continuing the discussion. There is an unwritten law that the parties to a journalistic controversy shall confine their replies to their respective journals, but as the one-sidedness of this kind of discussion is, to say the least, obviously unfair to the readers of such journals, we reproduce in another column the reply the *Sanitary Engineer* makes to the remarks which appeared in our issue for August 16.

WE do not like to be regarded as traducers of any of our fellow-citizens, and least of all do we wish the plumbers, for many of whom we have a sincere personal regard, to think that we have any desire to oppose their interests or to criticise any of their acts merely for the sake of criticism. We therefore venture, at the risk of being tedious to our readers, to return once more to the subject of what plumbers call "trade protection," that is, an agreement by which the dealers in plumbing materials sell their goods to plumbers, who are their principal customers, at a lower rate than to the general public, in regard to which we have written some things which seem to have been sadly misunderstood. Every one who has taken the trouble to read what we have said about this matter knows that we find nothing whatever objectionable in such an agreement, which is simply that which generally exists between wholesale dealers and those who buy of them frequently and pay their bills promptly, and it is with amazement that we find ourselves held up to scorn in the columns of the *Hydraulic and Sanitary Plumber* as being "affrighted" at the prospect that plumbers will secure a "reasonable advance" as profit on the goods they sell, or accused, as in a letter written to the same excellent journal, of "presumptuous ignorance" of furnishing "threadbare and garbled statements" to our readers, and of being connected with a "ribald" and "degraded" press.

IF the writer of this letter, who is evidently sincere in his indignation, would refresh his memory by referring to the columns of the *American Architect*, he would see at once that we have never thought of denying to the plumber, any more than to other retailers, a fair profit on the merchandise which he handles, and that all our criticisms, — warnings, if he wishes to call them so, have been directed against what we think to be the useless and foolish endeavors of certain plumbers and certain dealers to conceal the trade discounts from the public, which knowing that they are in some cases very large, naturally, though unjustly, believes that they are equally exorbitant in all, and that plumbers by means of them make enormous profits in their business, in ways which honest men avoid. Of course plumbers, and architects who are admitted to share the trade secrets, know that this impression is an erroneous one, and the latter, as we believe, conscientiously endeavor to remove from the minds of their clients the prejudice which they always find there against a body of men whose worth they know and appreciate; but both plumbers and architects also know that under cover of concealment for which the trade is now clamoring so strenuously, bills for plumbing goods are often presented to unsuspecting employers and paid, in which an advance of one, or two or even three hundred per cent on the cost of the goods is charged. Now, under the relations which exist between a plumber working by the day and his employer, the charging of such profits as these is simply swindling. There is no way in which anything else can be made out of it, and we repeat, with undiminished confidence, our opinion, the only one which we have ever expressed in relation to the subject, that the maintenance of a system which, like the present one of large secret discounts, makes such dishonesty easily practicable, benefits no one except the cheats in the trade, and injures the reputation and the business of all those plumbers — the great majority, as we are happy to believe, who think it right to deal fairly and openly with their customers, and wish for similar treatment in return.

THE writer of the letter in the *Hydraulic and Sanitary Plumber*, like an honest man, as we are sure he is, says that "as a matter of fact the trade price-lists which the manufacturers furnish are looked upon as being as much of a nuisance to the plumber as they possibly can be, and are tolerated only because the manufacturers prefer to keep them in existence for their own convenience, and not for the plumbers;" and again a few lines below, "The price-lists in question, while having a value of their own to plumbers in estimating on new work or determining the first cost of an article, are by no means the standard adopted for making charges to customers, and that fact is very well known, too, to the great majority." "The *Architect's* experience," he goes on to say, "may have led him to a different conclusion, and if that is the case, we can only say that even in the plumbing business dishonesty may be found as in others, but that it is the rule I cannot admit." Nor do we, as we take pleasure in saying, and we assure him that, entertaining the same high opinion as himself of the character of plumbers in general, we marvel all the more at their apparent persistence in endeavoring to establish a system in which observers outside the trade can see no advantage whatever to plumbers like himself, while it offers many and obvious opportunities for fraud to the unscrupulous ones. We have before us a copy of the agreement (printed elsewhere in this issue) presented for signatures to the manufacturers and dealers in plumbing materials by the Executive Committee of the National Association of Master-Plumbers, and would like to have our critic compare one or two articles in it with what he tells us is the practice of honest plumbers in regard to trade price-lists and discounts. The first article of the agreement proposes that dealers and manufacturers shall sell goods to no one except plumbers licensed by the President and Secretary of their respective Associations, the license to be in the form of a certificate, to be renewed every three months. The fourth article proposes

"That any plumber who waives his discount in favor of his customer shall be dealt with as one not entitled to the regular trade discounts, and his certificate shall be revoked, and remain so until he be properly reinstated and receive a new certificate from his Association." It is true that this agreement was rejected by the manufacturers and dealers, but it was nevertheless the product of the deliberations of the Executive Committee of the Plumbers' Association, drawn up, as the report of that Committee says, under "careful advisement from various sources," and was certainly offered as representing the opinions and wishes of the trade. If it does not represent the wishes of sensible and honest plumbers, it is time for them to say so, and until they do they must be content to remain in the position of having acquiesced in the attempt to force the adoption of a scheme which, in the words of the reply addressed by the manufacturers to the Committee which presented it, "were it possible to carry it into effect, would not only, in our opinion, be ruinous to your business, and dishonorable to yourselves, but would place you in the very unenviable light of extortionists before the eyes of the public." The dealers have quite as much reason for wishing to be polite to the plumbers as we have, and understand this particular point in the plumbing business quite as well as we do, yet we have never denounced the "protection" movement with half the energy that they show, and we shall not do so until we are satisfied that the better feeling in the trade is too feeble to oppose it.

La Semaine des Constructeurs announces the death of M. Paul Abadie, the architect of the great church of the Sacred Heart, at Montmatre, the Hôtel-de-Ville at Angoulême, with other buildings of note, and a man of high distinction in the profession. M. Abadie was born in 1813, and studied under his father, an architect eminent in his day, and at the Ecole des Beaux-Arts. After completing his course, he was attached to the Commission of Historical Monuments, and learned thoroughly in its service the characteristics of the ancient national styles of building. His reputation for archæological knowledge of this kind led to his employment in the restoration of the Romanesque church of Saint Front at Perigueux, one of the most interesting architectural monuments in France, and he was afterwards appointed inspector-general of ecclesiastical edifices, succeeding Vaudoyer. He was also an honorary member of the Royal Institute of British Architects, an officer of the Legion of Honor, and a member of several scientific societies.

SOMETHING has been said recently in most of the papers about a process for protecting iron from corrosion, recently patented by Mr. F. Maxwell-Lyte of England. The theory of the process is said to be that as the rusting of iron is necessarily accompanied by the development of electrical currents of a certain kind, if such currents can be prevented from formation at the surface of the iron oxidation will not take place. It seems that it is easy to prevent the electrical action which occasions oxidation of the iron by coating it with the oxide of a metal electro-positive to it; that is, one which when placed in a battery with iron and a solution of an acid, or an acid salt in water, would attract bubbles of oxygen instead of hydrogen. Zinc, tin and the alkaline metals hold this relation to iron, and therefore the oxides of these metals, when in contact with iron, although a galvanic current may exist, draw to themselves any oxygen which may come from the decomposition of water accidentally present, and hold fast to that with which they are themselves combined, leaving the iron either inert, or developing hydrogen, which does not effect it, and iron coated with these substances will remain unaltered for a long time. Lead, on the contrary, is feebly electro-negative to iron, its oxides losing oxygen when brought into galvanic relation with it, and the oxygen which passes thus from the white or red oxide of lead spread on iron as paint rusts it beneath the coating of paint, so that a zinc or magnesia paint prevents the rusting of iron which it covers, while lead paints promote that rusting. This discovery appears to form the basis of Mr. Maxwell-Lyte's patent, and his process consists simply in priming iron-work with zinc-white or magnesia, which protects it from the effect of a subsequent coat of more corrosive pigments. Although the theory of this process is new, the practice is certainly old. Every architect and student, and most builders, know that white lead paint put directly on wrought-iron tends strongly to corrode it, and many of them are also familiar with the practice, long common in New York, of priming iron beams with lime whitewash before painting them with the white lead which was, in the early days of fire-proof building, considered indispensable for finishing exposed iron beams.

MANY architects and builders have used hardware which, although proving on examination to be made of iron, possessed a bright bronze color, sufficiently near that of the more costly metal to deceive casual observers, and durable for all works not exposed to the weather or to friction. This finish, sometimes known as the Tucker bronze, is said by a correspondent of the *Scientific American* to be produced by coating cast-iron, cleaned and brought to a smooth surface, either with linseed oil or a varnish containing linseed oil, and then heating it to a point varying from four hundred and twenty degrees Fahrenheit upward, according to the depth of color which it is desired to obtain. This heat oxidizes the iron, together with the oil, which forms a hard transparent coating over the brown film of iron-rust which spreads over the smooth surface of the metal. The lowest degree of heat gives a pale tint, and the color deepens as the temperature is increased, until, if a sufficiently thick coating of oil is given, a shining black Japan is obtained. This process was patented in 1863, but the patent has now, of course, expired.

THE project for utilizing the sewage of Paris, not consumed by the farms of Gennevilliers, upon the low-lying portions of the forest of Saint-Germain and the meadows adjoining, seems to be in process of execution, notwithstanding the protests of the neighboring proprietors. The tract to be taken contains about twenty-seven hundred acres, and includes two large farms, a number of smaller lots, and a part of the forest proper. The city of Paris acquires the property indirectly through the Government of the Republic, paying all expenses and costs of every kind, but binds itself to rebuild in proper places the police-stations removed to make way for the irrigation works, and to submit to the direction of the State Government in regard to the details of the system of utilization. As this is to a certain extent experimental, the city very wisely refrains from purchasing the land outright, but takes a twenty-year lease of it, at a rent of twenty-seven thousand dollars a year, with the privilege of buying it at any time before the expiration of the lease for nine hundred thousand dollars. The most surprising part of the transaction is the smallness of the rent to be paid for the territory. Considering its position in the suburbs of the city, and nearly on the bank of the Seine, one would suppose that a rent of a hundred dollars an acre, for good farming land, would be nearer the value than ten.

THE Reverend W. C. Winslow, of Boston, who has done much to secure aid in this country for the great work now being carried on at Tanis by the Egypt Exploration Fund, publishes a brief account of the results so far accomplished. We have already spoken of the gigantic statue of Rameses II, one hundred and fifteen feet high, which Mr. Petrie, the director of the excavations, brought to light early in the course of the work. Mr. Winslow's description seems to indicate that the statue, though now broken, was originally carved out of a single stone, a block of red granite brought from Syene, five hundred miles up the Nile. In its finished state the figure weighs twelve hundred tons, and it is quite probable that, to avoid transporting unnecessary weight, it was carved at the quarry, just as large granite statues are at this day, but the original block can hardly have been less than twice the size and weight of the figure formed from it. How such masses of stone were handled we cannot understand. There is a passage in Herodotus which explains that the obelisks, monoliths of similar character, were moved and set up in position by hauling them to the top of a low artificial mound, and then excavating under the heavier end until it tilted by its own weight into its place; but this gives little idea of the methods by which the block for a statue was turned and shifted for the workmen, and still less of the mode in which the completed figure was transported from the Arabian mountains to the Delta of the Nile. Besides this colossus, the excavation has brought to light many other interesting objects, large and small. Among the latter are many papyrus manuscripts, coins, bronzes, jewelry, amulets, dishes and statuettes, two or three dozen of which were brought in every day; while the list of the former sort comprises an enormous granite sarcophagus, fourteen feet long and eighty-eight feet high, an obelisk of black granite, and many tablets and tombs, besides several temples of different dates.

THE LION OF BRONZE ON THE COLUMN OF THE PIAZZETTA, VENICE.

PALAZZO DUCALE, VENEZIA.

ON the morning of the 18th of September, 1883, the grass was to be extirpated from the summit of the columns of the Piazzetta. Two ladders had been joined together in order to reach the capitals, whose height from the ground surpasses fifteen metres. I climbed up myself, and setting my foot upon the capital, the size of which is three metres square, I felt myself small, so colossal seemed the Lion, whose wings reach one and one-half times the height of a man. In order to accustom myself to the proportions of the Lion, I went all around it. It is composed of several pieces held together by an iron frame-work, the bolts of which, oxidizing, have moved or entirely forced off the copper sheets covering them. Two fragments of bronze, broken by the rusting of the iron, have fallen from under the stomach, showing that the cast is, more or less, one centimetre thick.

The pieces of which the Lion is composed belong to different epochs. The most ancient ones are fortunately the most numerous, and belong to the time when the Doge Ziani erected these columns (1176). The others belong to subsequent renewals and the Napoleonic restorations, recognizable from the classicism of the modelling.[1] The right fore-leg, half of the left one, half of the right hind-leg, and the foot of the left one are not original. It is a pity that not one of the original paws remains, because the present ones have not the sentiment of any epoch: they are of indifferent workmanship. Tufts of hair upon the head have been replaced. The book held under the fore-paws is of lead. The wings are not only detached from the other parts of the Lion, but they belong evidently to a recent period; however, there were wings before, of which some traces are left, which we will notice later. The tail has also been restored.

All the rest, that is to say the head, the mane and the body, is original. The modelling of some parts, where the ancient Venetian *aurifex* thought proper to take special care of it, is really perfect. In order to convince one's self of it, it would be sufficient to note the muscles, sinews and veins of the paws not wholly restored or renewed. There is not any ostentation or affectation of anatomical knowledge; the artist has only indicated what contributes to the majesty of a symbolic animal.

On seizing the jaws of the Lion and looking into his mouth, I perceived the whole internal cavity. The jaws are armed with canine and molar teeth of most accurate workmanship; the skin is drawn into ridges, and conveys the impression that it is covered with hair at the sides of the mouth, which, when seen closely, loses completely its grotesque grimace.

A pair of whiskers, grooved from single pieces, represents the long bristles of the feline species. The eye-sockets are strongly marked; the brows are muscular and rounded. The eyes seem of a glassy substance, which is white and cut into triangular facets; the right eye sends from the bottom reddish reflections; they are a restoration, and are said to be of rock crystal, but they have not its transparency. The old guide-books do not mention the color which they had before; certainly they were not white, because they would have given a strange expression to the head of the Lion, or, like the present ones, would have made him appear blind. The choroid of the feline, like the chrysolite in an Italian poem of the thirteenth century, "casts rays of the color of fire," or like the topaz: —

"*Ha color d'auro e splendïente lome.*"[2]

If the eyes were not inlaid with such jewels, there could be set either carnelian or chrysoprases, or any other quartz *gatteggiante*. The eyes could also be even more fiery, without detracting from the effect of the bronze, if composed of one or more red gems.

The tufts of the mane begin at the neck and ears, where they are short and hooked, then developing into long, symmetrical locks, a lower one between two upper, run down the breast and lose themselves at the middle of the back. Every lock is formed of five or six cords, half a centimetre thick, flowing in serpentine form to a point, leaving the last undulation detached and raised, so that the mane is all bristling. Where the mane goes down along the shoulders, it covers the feathers of the base of the ancient wings; feathers may also be seen along the right side. These feathers are crudely cut for the insertion of the new wings. The difference between the original wings and the restored ones is plain: while the feathers of the first are concaved and uncut, those of the restored wings are convex and cut, making them more realistic. The ancient wings were nearer to each other and closer to the neck, as the original feathers are found where the mane reaches them, while the restored wings commence farther down. As to the form, the ancient wings must have participated in that solemnity which, inspiring itself from sublimity, does not descend to despicable details; the severe line which the head forms with the mane and the body, may give an idea of their grand simplicity. Mr. Ruskin, with the intuition which is natural to him, arrived at the supposition that the ancient wings were far wider in their sweep than these, and "shred into plumage." (*St. Mark's Rest.* I, 22).

The custom of cutting the wings, so that light might be seen between the feathers, was introduced by the Byzantines in their mosaics, and Giotto adopted it for the wings of angels. He was imitated by the artists of the fifteenth century who painted Lions of St. Mark, like Jacobello del Fiore and the *Donatus Venetus*, who kept themselves to the symbolic form of the wings.

The Lion of Bronze must have had, for a stronger reason, the wing cut into plumes, — in order to be perceived against the sky. There remains to us a meagre record of them in the wood-engraving of Breydenbach (1486). In a picture of Bassano, in the great Council Hall, where is painted upon a grand scale the column of the Piazzetta, we perceive the Lion with the wings cut in strips, and although, being only an accessory, the painter cared not to give it special expression, the material fact has not escaped him that the plumes were detached one from the other.

The Lion was once gilded; I have found the traces of gold in the protected portions of the upper jaw. Under the stomach there is a little door, restored, through which one could pass his head, but it is now locked; I do not know why.

I was unable to find any inscription on the ancient cast, or anything referring to the restorations; there are some initials, but they are recent and of no importance. I left the two fragments of bronze as I found them, lying upon the top capital.

This Lion of St. Mark, the symbol of the Venetian Republic, is admirable in so far as it expresses fierceness and magnanimous power. It looks far away, and, pressing its paws firmly against the book, seems to send to the Orient a roaring of defiance. Mr. Ruskin could not fail to perceive the beauty of "one of the grandest things produced by mediæval art," and judged it a work of the thirteenth century. (*Stones of Venice*, III, 233.)

The name of an *Aurifex Venetus*, of the year 1300, is found upon the bronze railings of the Church of S. Mark, and Vasari tells that the doors of the Florentine Baptistery, modelled by Andrea Pisano, were cast in bronze by Venetian masters, "very skilful in casting metals." But I believe that our bronze Lion is anterior to these works, and therefore anterior also to the S. Theodore, of stone, which, according to Sansovino, was erected upon the other column of the Piazzetta in the beginning of the fourteenth century. Without pretending that the Lion was placed upon the column soon after it was erected by the Doge Ziani, we may grant that in the *thirteenth* century there were *magistri Veneti* capable of undertaking such a work, if, shortly after, a good reputation followed them into Tuscany.

GIACOMO BONI, Architect.

[1] The Lion was lying in pieces at the Arsenal, as it had came back from Paris in 1815. It was joined and restored by the sculptor Bartolomeo Ferrari, and replaced upon the column the morning of the 17th of April, 1816.

[2] "Has the color of gold and shining light." The poem I allude to is the celebrated one in praise of Intelligence, one of the earliest monuments of our language, where a description is given of the gems decorating her crown.

WHY AND HOW.

WE have the greatest respect for a book that grows, and just as little for one that is manufactured. The former class is small, and as a rule the units that compose it are of real use and service, and any new accession to its ranks should be cordially welcomed; and the one[3] before us should be received as heartily as any. It was begun by the author because he perceived there was a real need for it, and the seed once implanted in his mind was allowed to grow in a somewhat erratic fashion; but naturally withal, for when a mistake was perceived in the work of others, he set himself to discover the causes and reasons of the blunder, and to devise a means by which similar errors could be avoided. The work thus done was laid aside until the chance to correct another abuse was perceived. In this fashion in the course of years a pile of complete branches had been collected, so that it at length seemed worth while to attach them to a parent stem, and so cleverly has this been done that few would discover that this new tree of knowledge had not developed by natural process.

Any one who has had his sensibilities set on edge by the atrocities "executed" by the regulation architectural draughtsman, that, in spite of all editorial care, so often find their way into print, cannot

[3] "*Architectural Picture-Making, with Pen and Ink.*" "Old Ebor" Folios. First edition, No. 1. By Benjamin Linfoot, architect, with illustrations by the author. 719 Walnut St., Philadelphia, Pa., 1884.

but have regretted that the verb could not be applied to the draughtsman instead of to the drawing, and cannot but have repined that there was no way in which draughtsmen as a class could be brought to see the error of their ways. Books of instruction in drawing there are in abundance, both for architectural draughtsmen and for artists; but for the first, the instruction is entirely in the line of mechanical or scientific drawing, while those for artists are distinctly for artists—as far as they go—and are quite useless for the would-be artist-architect.

Mr. Linfoot's book is, so far as our own knowledge goes, the first book that is intended exclusively for the architectural draughtsman who has a "soul above buttons" (*architectonice* T-square), and is intended for no other person whatsoever; and best of all while it deals exclusively with the æsthetic side of the subject it is unqualifiedly practical. There is not a page of it that is not of every-day working value to the draughtsman actively employed in the routine of office work, not a page that could fail to have immediate effect on such draughtsman's work; for even if he could not understand or acknowledge the truth of the principles laid down, he could hardly fail to take immediate advantage of the many "dodges" of which the author's long experience had shown the advantage, and which he has with great good nature detailed for the benefit of others.

Turning to the book itself, we find it an oblong book of goodly size, made up of some two dozen pages of text, and half as many more plates; and here we perceive one of the great defects of the work, the dissociation of the text from the plate. Granted it was necessary that plates and text should be within the same pair of covers, it would have been much more convenient and less exasperating if the text had, as it easily might have, faced the plate to which it referred. It is particularly annoying in a book of this size to have to turn backwards and forwards, from text to plates and back to text again. The evil that Mr. Linfoot attempts to alleviate is the inartistic way — sometimes childish, sometimes brutal, but almost always inefficient — in which the regulation draughtsman renders a perspective drawing in pen and ink. It is so generally perfectly plain that the draughtsman had no clear idea of what he desired to do, and so apparent that he was equally in the dark as to what means to employ, that one cannot but wonder his employer should ever allow him to make a second attempt. The time that has been wasted by diligent, painstaking fellows just for want of a little "know how," either intuitive or acquired! The usual formula seems to be: Keep at work: put in more lines, lines running here, running there, but always lines. Don't leave a blank of white paper anywhere; even in the skies work over your clouds, knead them, churn them, give them mass, shade, and shadow, but don't fail to give them enough ink.

Turn over the pages of any architectural periodical, and you will find plenty of "horrid examples," and where you now and then come upon something of pleasing effect, a little further search will prove, like as not, that it is a fraud, a trick caught from some more able fellow, and not the result of original and foreseeing intention. Indeed the really skilful and original men would not make a very large assemblage.

The book deals exclusively with picture-making — the work that the public believes is the architect's sole and only occupation — and not at all with architecture, except so far as to impress that the pictorial accessories should enhance, and not detract from the architecture of the subject that is being embellished. The points that are discussed — in an admirably suggestive style with nothing didactic or egotistic to excite the dissent of the reader — are light, shade and balance, outlining, shading, skies, foliage, figures, methods and appliances, and a few other topics of broader application.

With some of the author's reasoning we cannot agree, but if we cannot assent to his "why," we seldom have cause for dissenting from his "how" the desired result is to be obtained. For instance, we cannot perceive any great value in his theory of making what he styles a "synoptical chart" of the proposed effect before work is begun, and though his theory is not particularly elaborate — much less so than the semi-mathematical formulas in which involve themselves all theoretical writers, and some practical ones as well, who seem to think that when they attempt to explain *how* they do a thing they must manufacture a pseudo-scientific *why* as well, when the matter is one of pure instinct, or, if you will, artistic feeling. Such *ex post facto* reasonings are apt to be as fallacious as those which derive all modern achievements from the measurements and proportions of the Egyptian pyramids, or which seek to prove that Shakespeare hid in his verses everything, from a complete system of Platonic philosophy, the latest "fad," to a prophecy of every future event.

So, too, many will not agree with what is said about "balance," and will, as we have, study over Plate 3, vainly trying to believe that the author has quite proved all that he states; or that some of the alterations he suggests for his "horrid examples," are really the most judicious means of correcting abuses which unquestionably exist in the original. They will probably, also, while agreeing that the rendering suggested in Plate 10 for a brick wall and for a board fence are sufficiently good, wonder what Ruskin would say to the rendering here suggested for a rubblework wall. But the very fact that the observer sometimes finds cause for questioning the author's "how" serves a good purpose, as it sets him to discovering his own "why" for the error into which the author has fallen, and the author can hardly complain, if others follow his example, and seek their own improvement through disagreeing with the reasoning or methods he employs.

Some very useful things have been accomplished: for instance, in furnishing distinct models of, as well as suggestions for, foregrounds, skies, foliage, and other accessories, and sufficient and well-reasoned advice regarding their application and amplification. The two plates exhibiting architectural foregrounds, divided into "rights" and "lefts," are as instructive as they are practically useful. We note with pleasure that Mr. Linfoot introduces several examples from our good old friend Samuel Prout; and it is not a little surprising how these time-honored samples shine out, even amidst the author's own excellent work. Useful hints, almost pithy enough for aphorism, are frequent in the text, and abundant good advice is scattered here and there; as, for instance, when in speaking of the wretched caricatures of humans introduced into drawings, he says: "Young students, never be above copying a good thing, and never copy a bad one; what is more, never take any heed of your egotistical, ignorant, and conceited fellow-student or students, and there are such in many offices, who strive to undervalue a good effort of any kind, and exclaim: 'Oh! yes, he copied that,' and when in return anyone has anything to say derogatory of their poor efforts, which may not have been copied, exclaim with a truly Pecksniffian air: 'Well, it is only a rough sketch!'" This is said apropos of his advice to make a collection of good figure-subjects from the illustrated papers and make open use of them when putting in figures in a perspective.

As to "dodges" the initial-cut shows one, the way in which the author holds his pen in putting in the outline, and heavy shadows of his foliage, as this position allows of a greater freedom of movement — from the elbow. It is interesting, too, to know that the author draws as often with the point of a fine red-sable brush — quite in Japanese style — as with a pen, and that it is usual with him in rendering a drawing to use three distinct kinds and qualities of writing-pen, sometimes using it in the ordinary way, sometimes on the side, and again on the back — which he finds especially a useful way as an even line is secured without the splitting and spattering which attend its use in the common way — and shifts the manner of holding his pen to suit the work he is doing.

We cannot but regret that Mr. Linfoot found it desirable to be his own publisher, as an experienced proof-reader could hardly have passed over the many errors, grammatical as well as typographical, which the few pages of text contain, and we trust that the next issue of the series will be free from such annoying blunders as false references, at least.

IRON ROOFS.

A House at Paris. M. Guillard, Architect.

A LARGE number of excellent drawings and details of various kinds of roofs, principally such as are used for the covering of railway stations, have been brought together by the author of the work[1] published under the above title. In the preface he states that "his object has not been to deal with methods adopted for the calculation of strains, which have already been well considered by many practical authors in standard works, but to provide a record of the style of design adopted in some of the best known roofs that have been erected." The task which the author set himself he has performed with great care and ability.

The book consists chiefly of plates, of which there are sixty-five, besides a large number of diagrams interspersed with the letter-press, illustrating the principles upon which various kinds of roofs are constructed. The letter-press does not contain any detailed description or explanation of the plates, which are left to tell their own tale; this they do with sufficient clearness for all the purposes of the experienced architect or engineer, but, for the benefit of students a somewhat fuller explanation of each plate would have made the work more valuable as a book of reference.

The employment of iron in the construction of the principals of roofs may be almost said to have been introduced by the present generation of engineers, many of whom can remember the time when it was scarcely ever used in those structures except in the form of bolts and straps to hold together the several timbers. It first began to take the place of wood in the parts that were in tension, such as king or queen posts and tie-beams, for which wrought-iron was used, while the heads of the kings or queens were made of cast-iron for the heads of the rafters to frame into. Later on we find cast-iron employed for the struts which were in compression, the same material being also used for shoes to receive the feet of beams. Afterwards, when iron came to be rolled of various sections, it was found convenient to have every part of the roof of wrought or rolled iron, although

[1] "*Iron Roofs.*" By A. T. Walmisley, Assoc.-Mem. Inst. C. E. London: E. & F. N. Spon. 1884.

even in the present day we find cast-iron sometimes used in parts subject to compression only.

The author remarks "that many of the early iron roofs closely resembled the form of construction adopted for ordinary timber trusses," and an illustration of this is given in the iron roof of the House of Lords, which is a combination of wrought and cast iron. It was, however, soon found that other arrangements of the parts were better suited to the material employed, and the tie-rod, instead of being horizontal throughout, was generally made to slope upwards towards the centre, so as to give a greater clear height to the interior of the building. A strut was placed at the middle of each rafter and at right angles thereto, a tie-rod being attached to each end of the rafter and the lower end of the strut, so as to form a kind of inverted king-truss, while a horizontal tie between the ends of the struts completed the truss. It is on this principle that most of the iron trussed roofs have been and still are constructed, the number of struts and braces being increased with the increase of span. As an example of a large roof of this description the author gives the details of that over the Exeter station, erected about twenty years ago, the span of which is 132 feet; the struts in this case are of cast-iron. The cost of this roof is stated to have been about £16 10*s.* per square, while that of a similar roof of half the span was only £9 per square, it being generally found that the cost per square increases with the span.

In curb roofs, which have four instead of two principal rafters to each truss, the same method of stiffening the rafters is adopted, a strut being placed at the middle of each with tie-rods connecting it with the ends of the rafters, and cross-ties connecting the two sides together. An example of this form of roof is given by the author in drawings of that over the North-Eastern station at Leeds, of which the span is 89 feet.

In the illustrations of the Bristol-Station roof, we find an adaptation of the above-named principle to a roof having curved rafters. The span here is 125 feet, and the rafters are formed as lattice girders, 2 feet deep, with a curvature of which the versed-sine is 4 feet; there is only one strut, which is placed in the centre of each rafter with a tie at each end, and a suspension-rod in the middle holds up the centre of the tie-rod, which rises 10 feet above the springing. This roof was built on a curve, and the cost was £37 16*s.* per square, measured on plan. Where the span of a roof is very great it is found advantageous to have one continuous rafter in the form of a circular segment, which is stiffened by vertical struts attached at their lower ends to the tie-rod, and between these is fixed diagonal bracing to hold up the tie-rod, and keep the struts in compression. This form of roof is known by the name of the "bow-string" principle, and is seen in that over the New-Street Station at Birmingham, of which the span is 212 feet, erected in 1854 at a cost of £17 15*s.* per square. The Cannon-Street Station, in London, is another example given by the author, the span of which is 190 feet, built at a cost of £49 10*s.* per square. That over the Charing-Cross Station is also on the same principle, with a span of 166 feet, the cost of which was £40 per square.

The bow-string principle was also adopted in the construction of the Lime-Street Station at Liverpool, erected about ten years ago, of which Mr. Walmisley gives the details. In this roof the "boom" is a curved girder of I section 14½ inches deep, having a rise of 42 feet with a span of 212 feet. The depth at the centre to the tie-rod is 20 feet, and the boom is stiffened by twenty braces forming a series of W's, each brace consisting of four angle-irons with cast-iron distance-pieces to give them an outward swell in the middle; these are attached to the tie-rod by means of bolts. The cost of this roof was £30 per square.

A form of principal frequently adopted in station roofs consists of sloping rafters with a tie-rod across from foot to foot, with vertical struts and diagonal bracing between the rafters and tie. The roof of the Broad-Street Station of the North London Railway, erected in 1865, is an example of this type, the span being 95 feet. The station at Preston has a similar roof with a span of 77 feet. In the London-Bridge Station of the Brighton Railway, the same principle is employed with a continuous curved rafter, having a span of 88 feet.

A method which is sometimes employed in roofs of considerable span consists in placing horizontal lattice or Warren girders horizontally across from wall to wall, and covering them with a series of "ridge-and-furrow" roofs of small span. This plan was adopted in the Exhibition building at Hyde Park in 1851, and has also been employed for a roof of 114 foot span over the Bridge-Street Station at Glasgow, which is carried on nineteen Warren girders placed 31 feet 6 inches apart, and having a depth of 12 feet. The cost of this roof and the covering was £22 5*s.* per square. The roof of the Central Station at Glasgow is also on this system, being carried on seventeen lattice-girders spanning the whole width of 213 feet 6 inches, having a depth of twenty feet; these are braced longitudinally with diagonal braces attached to horizontal lattice-girders, which carry the gutters. The covering is formed of ten spans of ridge-and-furrow roofs; and the cost was £28 17*s.* 6*d.* per square. Another roof built in this way is that of the Citadel Station at Carlisle, which is carried on twenty-four girders of single-lattice pattern, 15 feet deep, and of various spans, the longest being 154 feet. In this case the ridge-and-furrow covering runs parallel with the supporting girders.

The class of roofs to which modern engineers appear to be most partial is that in which the principal consists of an arched rib of sufficient depth to carry the load of the covering, and formed either with a solid web or with open lattice-work. As all arches have a certain amount of horizontal thrust outwards at the springing, it is necessary to secure the feet of the curved rib from overturning the supports, either by placing the tie across, as in the bow-string principle, or by giving sufficient solidity to the abutments. Where the supporting walls or piers are carried up to a considerable height it is difficult to give them sufficient strength to resist the thrust of an arched roof of wide span, in which case it is usual to introduce a tie-rod across to secure the ends of the rib from thrusting on the walls. This tie-rod is held up to the rib by light suspension-rods, and no bracing or strutting is required, as the rib itself has sufficient strength to carry the load. An example of this kind of roof is seen in that over the Victoria Station of the London, Chatham and Dover railway, having a span of 129 feet. The arched rib in this case is formed as a lattice-girder, 4 feet deep, with a rise of 32 feet in the centre; the tie-rod being held up to it by fifteen suspension-rods, and its centre being 8 feet 6 inches above the springing-line. A similar form of roof is employed to cover the Central Station at Liverpool, where the main ribs are 160 feet span, with a rise of 40 feet, the tie rising 14 feet in the middle. The main ribs are 55 feet apart, and connected by lattice purlins, which support five intermediate ribs. Another roof of this type is that over the Queen-Street Station at Glasgow, having a span of 170 feet. The rise of the ribs is here 44 feet, and of the tie-rods 14 feet 9 inches, the latter being held up to the ribs by six suspension-rods. Each rib is latticed on the Warren principle, and is 4 feet in depth. The cost of the roof and covering was £21 per square.

Wherever a good abutment can be obtained for the arched rib, it is usual to dispense with the tie-rods as in the roof of the Metropolitan Railway Station at High-Street, Kensington, which has a clear span of 90 feet, the ribs being elliptical, and formed as solid plate-girders, 16 inches deep at the centre, and rising 29 feet above the springing. This station being in a cutting no extra expense was incurred in providing sufficient abutment to the arch.

The largest single-span roof on the arch principle that has been erected is that over the St. Pancras Station of the Midland Railway, which the author has illustrated by four plates. Each rib of this roof is in the form of a four-centered or Tudor arch, having a clear span of 240 feet, and a rise at the centre of 96 feet. It springs from the level of the platform, the thrust being chiefly taken by the heavy brick piers on which the feet are secured by means of anchor-plates and strong bolts carried down to the foundations. As an additional precaution to prevent any dangerous thrust on the walls, the main floor girders which carry the platform and rails are made to form a continuous tie between the feet of the rib. The construction of the rib is that of a lattice-girder, 6 feet in depth. There are twenty-five of these main ribs in the roof, placed 29 feet apart, with trussed purlins between them, which carry the intermediate ribs. The upper part is covered with ridge-and-furrow roofing, which runs parallel to the main ribs. One of the most remarkable features about the erection of this roof was the timber scaffolding employed to raise each rib into its place. This consisted of a travelling stage, dividing the span into three parts, the side stages having five and the centre six divisions each, and four divisions in each stage from back to front. The first staging travelled on 123 wheels, 2 feet 8 inches in diameter, running on a beam of timber 18 inches square. The cost of this roof was £31 10*s.* per square.

Another roof of similar type is that over the St. Enoch Station at Glasgow, in which the rib is elliptical, or nearly so, and has a span of 198 feet, with a rise of 80 feet. Each rib is 5 feet in depth, and is formed as a Warren girder, being secured at the feet to a base-plate which is carried under the platform for about 13 feet, and is anchored down with strong bolts. There is also a similar roof over the Central Station at Manchester, with a span of 210 feet and a rise of 85 feet. The roof of the Drill-Hall, Derby, is also made on this principle, the ribs, which are 2 feet deep, springing from the level of the ground, and having a span of 75 feet with a rise of 30 feet.

The station at York is 234 feet wide, and is built on a curve in plan. It is covered by four elliptically-arched roofs of unequal span, resting on three rows of iron columns 18 feet high. The outer walls have strong buttresses to resist the thrust of the arches, of which the widest has a span of 81 feet with a rise of 27 feet. The covering of the upper part is on the ridge-and-furrow system. Where the springing of an arched rib is raised to a considerable height above the ground, it is necessary to give it as much as possible the stiffness of a horizontal girder, so as to reduce to a minimum the outward thrust. In the roof of the Crystal Palace, at Sydenham, which has a span of 104 feet, this has been done by making the semicircular ribs 8 feet in depth, and forming them of double lattice-work; also any horizontal thrust that might arise is transmitted by means of a cast-iron framework to a system of columns connected by girders and braces, which renders the whole structure perfectly rigid. In the Agricultural Hall at Islington the roof is formed of latticed ribs, having a span of 125 feet, and rise of 51 feet, which rests on a double row of braced columns, forming a base of sufficient width to resist the thrust of the ribs, which is conveyed through the gallery girders to the outer walls. The roof of the Paddington Station of the Great Western Railway, which is 240 feet wide, is formed in three spans of segmental ribs, the centre one having a span of 102 feet with a rise of 33 feet 9 inches; the depth of the ribs increases from the centre towards the springing.

The Middlesbrough Station is covered by two unequal spans of curved ribs forming pointed arches, the larger one being struck with

a radius of 42 feet, and having a depth of 2 feet; these ribs are formed of open lattice-work.

Iron is frequently employed in the construction of domed roofs over circular or elliptical areas. That over the British Museum reading-room, built in 1857, is circular on plan with a span of 140 feet and a rise of 106 feet; and consists of twenty circular iron ribs meeting at the top in a circular ring 40 feet in diameter. The ribs spring from the top of cast-iron stanchions, and the space between them is filled up with brickwork.

The Albert Hall at Kensington is covered with a domical roof of a different type. This building is elliptical on plan, the length being 219 feet and the width 185 feet. The roof is formed of thirty half principals springing from a continuous iron curb laid on the top of the wall, and meeting at the centre in an elliptical ring. Each rib is a girder with curved top and bottom flanges meeting at the end which rests on the wall, and having a depth of 17 feet 9 inches at the summit, the rise of the lower flange being 33 feet above the springing. Each half-principal is divided into seven bays by struts with cross-bracing between. There are seven rows of latticed purlins fixed all round the roof between the principals.

The largest dome that has ever been built is the wrought-iron roof of the Vienna Exhibition, designed by the late J. Scott Russell, and erected in 1873. This building is circular on plan, with a clear span of 343 feet, the height from the ground to the springing of the roof being 80 feet. The roof is conical, and slopes at an angle of 30° to the horizon. It is constructed of rolled plates riveted together, the lower edge being strengthened by a wrought-iron curb in the form of a continuous box-girder. At the top of the cone there is an opening 100 feet in diameter, on which is another curb surmounted by a drum 34 feet high, on which is another cone of plate-iron supporting a lantern. The entire cone is stiffened with lattice-girders running from curb to curb up the side of the cone, with ring-girders at intervals laid parallel to the curbs. These girders and rings are placed outside the cone. In this mode of construction there is no outward thrust upon the supports.

In the construction of iron roofs it is very important that great care should be taken in forming the joints of the various parts, as the fracture of a single bolt might endanger the whole structure. The author has given numerous examples, drawn to a large scale, of the modes of connecting the parts of roofs, which will be of great value to the designer of these structures; but we think that some further description of these matters might have added to the utility of his book. The common mode of fixing the ends of the tie-rod to the feet of the rafters is by means of a round bolt passed through both of them; thus in the roof of Bristol Station the tie of a roof, 125 feet span, depends entirely on the shearing strength of a single pin $3\frac{1}{2}$ inches in diameter; and in that of Exeter Station having a span of 132 feet, it is held by a bolt $3\frac{1}{4}$ inches diameter. In the roof of Swansea Station, with a span 64 feet 6 inches, the tie is held by a pin only $1\frac{1}{4}$ inches diameter. The end of the tie of the Cannon-Street Station is held between two plates by means of key-wedges, so that it can be tightened up if necessary, the plates being secured to the foot of the rafter with fifteen $\frac{7}{8}$-inch bolts; and in the London-Bridge Station of the Brighton Railway, the same method is adopted, as well as in that of Lime-Street, Liverpool. Where the tie-rod is in several lengths, as is the case with all large roofs, the ends are united either by being screwed into sockets, or else by bolts passed through them, the ends being widened out to receive the bolts. The screw-joint has the advantage of allowing the tie to be tightened up when necessary. The ends of struts are fixed to the rafters with bolts or rivets, and are either bolted directly to the tie-rod or else to a plate attached to the screw-socket above mentioned. Suspension-rods are bolted to the web of the rafter and passed through the tie-rod with nut and screw to tighten them up. Braces are generally bolted to the rafter, and also a plate attached to the tie-rod; but in some large roofs they are fitted with key-wedges or screwed into sockets so as to allow of tightening.

In roofs of large span which have tie-rods, one end is generally laid upon rollers to allow for expansion and contraction by change of temperature. In the roof of Exeter Station, of which the span is 132 feet, it was found, however, after some time had elapsed, that the rollers had never moved, and might have been dispensed with. In arched roofs without ties it is impossible to leave one end free, consequently the only way in which they can expand is by raising at the crown.

One great drawback to the use of iron for roofs is its liability to corrosion and decay, especially in the case of wrought-iron, so that a few years of neglect might cause the strongest framework to fall to pieces. Numerous methods have been devised for preventing decay, that of galvanizing being very largely used; but this process is said to render the iron brittle. The most efficient protection for iron appears to be that of coating it with magnetic oxide by exposing it to a current of highly-heated air. This is known as the Bower-Barff process. Even this protection, however, seems to fail where the metal is subjected to severe strains, which cause the coating to peel off from wrought-iron and steel, although it answers very well for cast-iron.

Mr. Walmisley is of opinion that "oiling is a very much better protection from the effects of the weather or the action of steam than painting, but care is needed properly to clean off the black scale or oxide formed upon the iron by contact with the air immediately after leaving the rolls."

A process is said to have been recently invented of rendering iron rust-proof without diminishing its strength, by alloying it with other metals, as copper and zinc, which perhaps may revolutionize the whole system of iron working. The discoverer of any efficient process of preserving iron might certainly be regarded as a benefactor of the human race. — *The Builder.*

THE ILLUSTRATIONS.

ACCEPTED DESIGN FOR THE GARFIELD MONUMENT, CLEVELAND, O. MR. GEORGE KELLER, ARCHITECT, HARTFORD, CONN.

THE tower rises from broad terraces, which are reached by wide-spreading steps, forming a dignified approach to the monument. A projecting porch at the base of the tower contains a vestibule, on one side of which is placed the keeper's office, and on the other a room for a visitors' register, and for the reception of interesting relics. The vestibule leads into a round, vaulted chamber, the stone domical roof of which is carried on eight massive polished granite columns, arranged in a circle around the sculptured tomb, which occupies the centre of the chamber. The capitals of the columns and the moulded arches between are richly carved; the pavement is tiled in harmonic colors and design, and the whole is lighted by richly mullioned windows which throw a softened light on the tomb. An aisle, or ambulatory outside of the columns surrounds the chamber, the side wall of which is decorated with niches for the reception of statues or vases of flowers, and window seats are formed between the jambs of the mullioned windows. A spiral staircase of stone leads from this ambulatory to the top of the tower, so constructed that in ascending the tower it winds around the tomb below. In making one revolution of the tower there are four flights of stairs, and a landing is provided at the foot of each flight, lighted by triple windows, from which a view of the landscape can be had. At the level D (see section) the spiral staircase opens on a wide gallery from which the surrounding country can be viewed, and at the still higher level E a more commanding view can be obtained.

On the outside of the monument, above the deeply-recessed portal, is a band or frieze of sculpture, six feet in height, extending entirely around the base of the tower, and within easy view from the ground. It is divided into panels containing bas-reliefs which represent, in a graphic manner, the career of Garfield as an educator, a soldier and a statesman; the long and anxious waiting and watching of the world over his death-bed, and the remarkable funeral procession from Elberon to Cleveland. The arms of the different States are inserted in the parapet tower.

The remains of the deceased President are enclosed in a crypt, built below the level of the chamber, and immediately under the carved tomb.

Vaults for his family are provided back of his chamber, occupying the space between two of the bays.

Ohio stone is to be used for the structural part of the design, in connection with buff-colored terra-cotta for the frieze of sculpture, which runs around the base of the tower. The whole monument can be built thoroughly and artistically for less than $150,000.

Of this design, Mr. Henry Van Brunt, of Boston, one of the experts employed, speaks as follows in his report, submitted to the jury :—

"Its closest competitor (No. 25), following a type, but not an individual of a type, gives us a round tower, like the keep of a French castle of the sixteenth century, with a machicolated cornice and a bold conical roof in two steep ascents. An order of canopied and traceried windows enriches and breaks the summit of the tower. At its base projects a square porch, decorated externally with an historical frieze, and containing a recessed doorway with the memorial statue in the centre; within this porch is a vestibule giving access to the mortuary chamber in the lower story of the tower, which is capable of noble development, though wanting in the sort of dignity which size alone can confer. The shaft of the round tower is occupied by a staircase. I commend this design more for its capacity for development than for its actual excellence of composition, though in this respect it is inferior to none in the exhibition. The form is large and noble, and its execution is within the reach of the means at your disposal. I do not object to its military suggestions, its type being a tower of defence; but I venture to suggest that a new significance might be conferred upon it by inscribing upon its stones, not in panels, but frankly upon the curved surface of masonry, in great raised letters, sentences which shall recall the most important utterances of the deceased President. I would propose also the enlargement of the porch, so that the statue may have a more worthy environment; an enlargement also of the vestibule so that the first runs of the stairway may be contained in it, instead of occupying the ambulatory of the inner chamber; I should also remove the columbaria to a vault underneath, thus giving the memorial chamber a large scope. The entrance should be turned towards the city."

Several of the alterations here suggested have been incorporated in the amended design which is here published.

THE CATHEDRAL CHURCH AT SÉEZ, FRANCE.[1]

ECCLESIASTICAL history refers the establishment of the bishopric of Séez to the fourth or fifth century. Azo, who succeeded to the mitre in one of the last years of the tenth century, erected the first cathedral that is upon record at Séez. William of Jumièges relates of him that he destroyed the walls of the city, and with their stones built a church in honor of St. Gervais, the martyr, "*ubi sedes episcopalis longo post tempore fuerat.*" The same author tells that, in consequence of this church having been turned into a place of refuge by some rebels, about fifty years afterwards, Ivo, the third from Azo

[1] From *Cotman's Antiquities of Normandy.*

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PHOTO CAUSTIC. HELIOTYPE PRINTING CO. BOSTON

Accepted Design for the Cleveland Garfield Monument.—Mr. Geo. Keller, Arch't.

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The American Building: Bedford & Kingston Streets: Boston: H. H. Richardson, Arch't.

Central Dome.

Capitals in Entrances.

General View.

Sketches by C. Edson Pearce.

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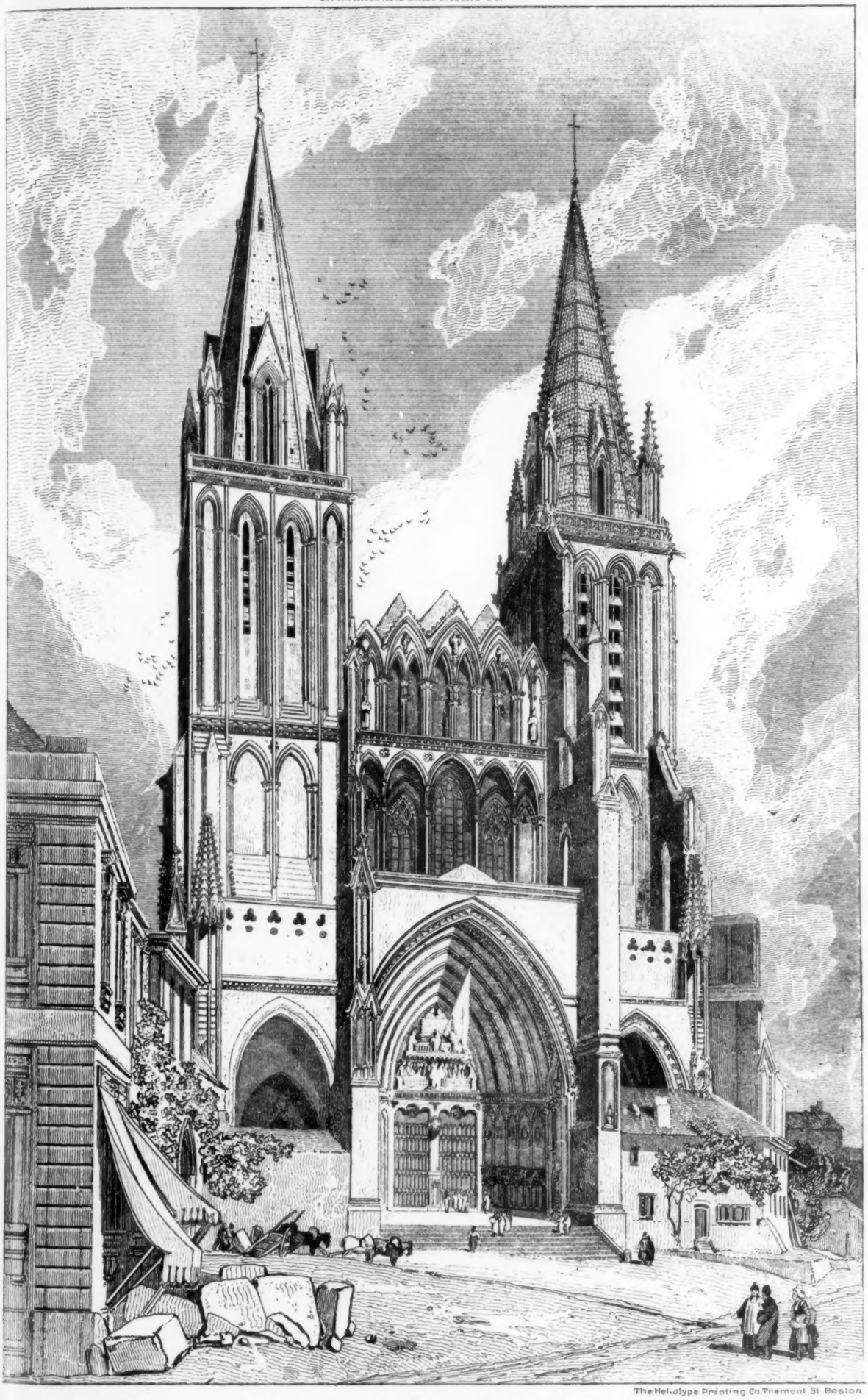

The Heliotype Printing Co. Tremont St. Boston.

CATHEDRAL CHURCH OF NOTRE DAME, AT SÉEZ.

West Front

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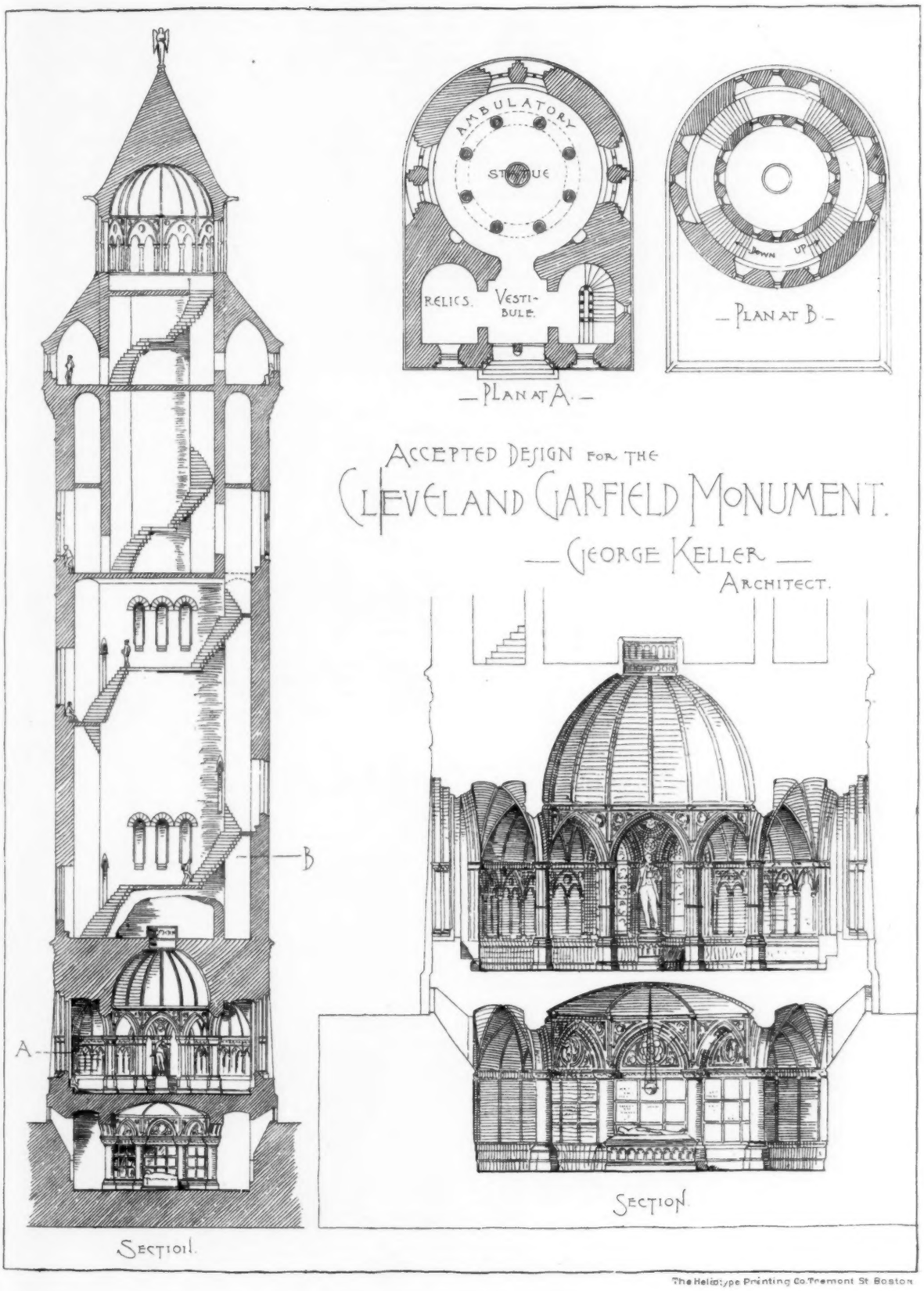

ACCEPTED DESIGN FOR THE

CLEVELAND GARFIELD MONUMENT.

GEORGE KELLER
ARCHITECT.

The Heliotype Printing Co. Tremont St. Boston

upon the episcopal throne, set fire to the adjoining houses, for the purpose of dislodging them, and the church fell a victim to the flames. The act, though unintentional, brought upon the prelate a severe reprimand from the Pope, and Ivo, to repair his fault, undertook a journey to his relatives and friends in Apulia and Constantinople, whence he returned loaded with rich presents, by the aid of which he undertook the erection of a new church upon so large a scale that "his successors, Robert, Gerard, and Serlo, were unable to complete it in fifty years." The cathedral then raised is said to be the same as is now standing, and there is nothing in its architecture to discredit such an opinion. The first stone was laid about 1053; the dedication took place in 1126. Godfrey, archbishop of Rouen, performed the ceremony in the presence of Henry, then duke, who at the same time endowed the church with an annual income of ten pounds.

The diocese of Séez is surrounded by those of Lisieux, Mans, and Bayeux. According to De Mossville, it extended, before the revolution, twenty-five leagues in length, and from eight to ten in width, comprising the districts of le Homee, les Marches, and a part of le Perche. The towns of Séez, Alençon, Argentan, Falaise, Hiesmes, Montagne, and Bellême, together with several smaller towns and five hundred villages, were also included in its limits, as were five archdeaconries, six rural deaneries, and many abbeys and other religious houses. The episcopal revenue was estimated at only ten thousand livres.

The church of Séez may be compared in its architecture, with those of Coutances and of Lisieux; they are unlike, indeed, but by no means different. The points of resemblance exceed those of a contrary description: —

"facias non omnibus una,
Nec diversa tamen, qualem decet esse sororum."

Severe simplicity characterizes Lisieux; Coutances is distinguished by elegance, abounding in decoration; Séez, at the same time that it unites the excellences of both, can rival neither in those which are peculiarly its own. On the first view of the church, its mean and insignificant western tower strikes the spectator with an unfavorable impression, which, on nearer approach, the mutilated and encumbered state of the western front is by no means calculated to remove. And yet this western front, all degraded as it is, cannot fail to derive importance from the great depth of the central doorway, which is no less than forty-seven feet, a projection exceeding that of the Galilee of Peterborough Cathedral. It is in the interior that the beauty of the church of Séez is conspicuous. The noble, lofty arches below; the Moresque ornament, like those of Bayeux and at Coutances, in the spandrels; the double lancet arches of the triforium, placed in triplets; and the larger pointed arches above, arranged two or three together, and encircled with arches of the Norman form, though not of the Norman style — all these beauties, added to the enrichments of the sculptured walls and windows of the aisles, render the cathedral, if not the first of Norman religious building, at least in the number of those of the first class.

"*Extremi primorum, extremis usque priores.*"

The following are the dimensions of the parts of the building: —

	Feet.
Length of nave (including a space of 64 feet under the towers),	218
" choir,	57
" aisle behind the choir,	14
" Lady-chapel,	25
" each transept,	39
Width of nave and choir, including aisles,	72
" Lady-chapel,	20
" transepts,	30
Height of nave and choir,	80
" north-west spire,	232
" south-west spire,	210

DETAILS FOR THE AMES BUILDING, BOSTON, MASS. MR. H. H. RICHARDSON, ARCHITECT, BROOKLINE, MASS.

WE add to those published last week a few more details from this interesting building.

THE CONSTRUCTION OF CHIMNEYS.[1]

CHIMNEYS, at present at any rate, are integral and important features of ordinary buildings in England. It may be that they can and will ultimately be altogether dispensed with, and our towns made, by the progress of economic science, to resemble those in the East — mere collections of flat-roofed boxes; and these may possibly be fed with fresh air of varied temperature, and drained of their fouled air by some parish pump and common heating apparatus. When this scientific millennium arrives, such dwellings may be left to purely scientific men, to whom æsthetic considerations are questions of superfluity.

I have, however, now to speak as an architect, addressing a sanitary conference, upon chimneys as existent, and I wish to show how they can and should be treated, that they may be practically useful and ornamental as well. They have been both in former times; witness the graceful chimney-shafts of Grosmont Castle, Southwell Priory, Hampton Court, and a host of Elizabethan mansions, the acknowledged picturesqueness of which is mainly due to the treatment of their chimney-stacks. Alas! however, they are seldom either useful or ornamental nowadays, as a glance at the skylines of our streets will reveal, since they are almost invariably disfigured by ugly cowls and "tallboys." These are but records of domestic misery and discomfort, every one representing a martyrdom, endured until it became intolerable; and their aggregate cost amounts to a tax upon the inhabitants of our cities, which were it an enforced one, might lead to a revolution. Yet the makers of such monstrosities occupy no inconsiderable space in this very Health Exhibition, and recommend their wares as palliatives for a disease which they assume to be not only universal but inevitable. I maintain that it is not the latter, and need not be the former, and that such costly and ugly excrescences may be altogether dispensed with, if but a little attention be given to the proper construction of these portions of our buildings — chimneys, and fireplaces.

Now, let me ask, why do our chimneys smoke? First, because, as a rule, air is not laid on or provided to houses as water is; but rather, indeed, it is in general sedulously excluded. The more sanitarily impervious (that is to say, air-tight) we make our dwellings, the more necessary it is to provide for the admission of fresh air to their interiors, and, unless this be done, smoke cannot ascend the flues of their chimneys; secondly, chimneys smoke because the fireplaces are ill-constructed, and gathered over from the openings of the fireplaces to the flues in such a gradual manner as to leave large vacant spaces above the grates, which act as reservoirs for stagnant cold air, by contact with which the smoke is chilled and prevented from rising and being drawn at once into the flues; thirdly, chimneys smoke because flues are ordinarily made too large (the usual size is 9″ x 14″); they should rarely be made more than 9″ x 9″; fourthly, because no provision is made in the flues for such down draughts of air as may invade them to expend and exhaust themselves before they reach the fire-place; and fifthly, because the tops of the chimney-shafts are not carefully constructed with guards against wind in a proper and sightly — that is to say, an architectural manner. Usually all such provision is left to be supplemented by some miserable metal makeshifts, by the chimney quacks whose fantastic creations Dickens satirized so keenly, and yet, as it would appear even from this exhibition, quite vainly.

As it is useless to expect that chimneys can properly perform their office, of conducting readily into the outer atmosphere the smoke from fireplaces, unless their construction is proper throughout, I shall treat of the fireplace, flue and chimney-top as a whole, of which the several parts are inseparably connected; and I shall begin at the bottom with the fireplace, as the most important of the three, and the one most commonly in fault in the case of smoking chimneys, although it is generally the last to be noticed or examined with a view to its correction. The grate itself, however, I shall leave for later consideration, though it is by no means of the least importance.

The first thing to be done is to provide a good and sufficient supply of fresh air to the fire-place from the outside of the building. To insure its being good it is well, when possible, to bring this from as high a level as can be arranged, yet not from the top of the chimney-stack, lest smoke from other flues be drawn down thence with the fresh air. It may be drawn from the lower part of the stack, just above the roof, by special air-flues brought down to the chimney jambs. This, however, is not always possible, and then it must be brought in through the walls, or by pipes through the floors. An advantage of bringing the fresh air to the fireplace, rather than to any other part of an apartment, is that even if cold, it does not produce the inconvenient draughts usually complained of. It spreads then upwards and gradually, before being finally drawn up the chimney by the fire in the fireplace; whereas, if admitted elsewhere, its passage is direct to the fire, and unpleasantly so to those who may intercept its course. When no provision for air is made, it has to force its way in at windows and doors, with the same result, made all the worse because of the low temperature at which it enters. The air, however, brought to this point, may be tempered or warmed by being made to pass around the grate before it is admitted to the apartment, and an essential for both comfort and health is that it should be so tempered; every grate, stove, or heating apparatus should, in fact, be thus made the fountain or source whence fresh air is admitted to apartments.

The next point to be considered is that of the outlet of the smoke from the fireplace to the flue. The flue should be here contracted at once to its normal size, or rather made a little smaller, immediately above the fireplace, in order to promote a quick draught of the smoke into it. The usual construction of this part of chimneys, already adverted to, does not conduce to this end. The opening of the fireplace is gathered gradually, in an arched form to the flue, leaving an objectionable space for cold air. Now arch and chimney-bar may be economically dispensed with by forming a mantle-block in Portland cement concrete *in situ*, extending the full width of the wall, and nine inches longer than the opening, and nine or twelve

[1] A paper read by John P. Seddon, at the Conference of Architects at the International Health Exhibition.

inches deep, pierced with the smoke-flue in the centre, and one for warmed air on either side. These may be circular, and about eight inches in diameter, and thus, being slightly smaller than the flue over, will insure a quick draught to the smoke-flue. The side holes are intended as outlets for the fresh air that has passed round the grates, and thus can be conducted by flues built above the mantle-block to gratings for admitting it into the apartment, either in connection with the chimney-piece, or just below the ceiling.

The construction of the smoke-flue from above the central hole in this mantle-block is the next point deserving and requiring consideration. As has been said, this is ordinarily made 9″ x 14″, but hist is too large, and as such becomes a frequent cause of smoking chimneys. Flues should not generally be made more than 9″ x 9″ in brickwork, and are better if lined with fire-clay pipes within such, which reduces them to about eight inches in clear circular diameter. The interior surfaces of the pipes should not be smooth, or else much inconvenience will be caused by frequent small falls of soot, from its being unable to cling to the pipes at all.

Midway between the top of the mantle block and the ceiling line of the apartment, the smoke-flue should have a portion expanded and formed in such a manner as to break the direct line of ascent of the smoke. This is in order to allow down draughts, or gusts of air that have invaded the flues from the top to expend themselves, without checking the smoke as it rises from the fireplace. A flat ledge should be provided in this expanded part of the flue, immediately under the smoke-flue above, that air driven down may impinge upon it, and be diverted, and a sideways rotary motion given to it, directing it upwards again, together with the smoke rising from below. Specially formed pipes can be introduced into flues lined with fire-clay pipes for this purpose, and more than one of these may be inserted in the course of the flues with advantage.

We now have arrived at the chimney-stack above the roofs, and the principal object in its construction is to maintain throughout its warmth, as it is there of course exposed to cold and damp; and it is well known and observed that those chimneys which are in external walls are, from this cause, far more liable than others to smoke. Pervious brickwork becomes saturated by rain, and the flues consequently reduced in temperature are unable to maintain the requisite upward draught. It is well, therefore, for this reason as well as for additional strength, that the chimney-stacks above the roof should be built in cement instead of common mortar, and of impervious bricks or stone and lined with fire-clay pipes.

The tops of the chimney-stacks need careful arrangement, because the exit of the smoke from them is very liable to be disturbed and hindered by gusts of wind, particularly when beneath other high objects in the neighborhood. There should, therefore, be at the top of every flue an expanded space, within which most down draughts of air will rotate and expend their force without invading the flue below; and there should be louvred openings so arranged as to direct the winds upwards, and so make it assist, instead of interfering with or retarding the exit of smoke. This is the object generally, and often rightly attempted by the supplementary cowls, at any rate by the best of them; but it may and should be rather executed in proper architectural form, and durable and sightly materials, such as stone, brickwork or terra-cotta, instead of metal. Terra-cotta is perhaps specially suitable, as being very easily manipulated into the somewhat complicated forms required for the purpose.

So much, then, for the construction of these three parts of a chimney — the fireplace, the flue, and the chimney terminal of the stack. Unless all are well and properly executed, no special appliances for particular parts can be of much avail. I have endeavored to point out the general principles that I think should be attended to in connection with them, and believing that the health and comfort of the community is at present very injuriously affected by their general neglect, I earnestly commend them to the consideration of this Conference.

There is, however, one more part connected with the chimney which is perhaps quite as important as any of the rest with which I have dealt, but what I have to say about it is somewhat more tentative and experimental. This is the grate within the fireplace. Volumes have been written about it, and yet it remains open for discussion, and inviting improvement. My contributions to its literature will be short, and yet it will embody the result of much time and thought expended upon it.

Burning coal principally, as we do in England, we have to seek in the consumption of its smoke, or at least of as large a proportion of it as possible, within the grate itself, the solution of the main difficulties we are considering. For the smoke being consumed, smoky chimneys will be cured. The office of the flue will then be to convey away the gaseous products of combustion only, and not soot. This is, I believe, attainable by means of diverting the current of the smoke, after it has issued from the top of the fire, in such a manner as to force it to pass through the body of the fire before it ultimately is allowed to escape up the chimney-flue. Perfect combustion is, I think, more to be sought than what is called "slow combustion," and it is a mistake in my opinion to smother a fire in its own ashes by preventing their dripping through a grating into an ash-pan. The cheerful aspect of an English open fire is not likely to be driven out of fashion by even Health Exhibitions; nor if it could be, and the attempt were made, do I think that the public salubrity would be improved by the substitution of any description of close stoves in apartments, notwithstanding the preference they have obtained on the Continent, and to a great extent in America. Nor do I believe that any of the systems that have been proposed for keeping up throughout dwellings, an equable temperature, are likely long to curtail the liberty of English subjects to make their several rooms of whatever degree of heat may please their occupants. I should certainly therefore not advise the most ardent believer in such a system to expend capital in building houses otherwise than as at present, or to try to dispense with chimneys, the construction of which I have been dealing with.

But there are many grates shown in this exhibition which presume fresh air to be brought to them, and in which means are provided for warming and distributing such air into apartments, and I cannot too highly commend the system, and advise its universal adoption by the public, and I may point out that this can and should be done, more often than it is, in the case of the kitchen chimney, which is almost always in use, and that the air warmed thereby, not being wanted in the kitchen, should be conducted to the general hall of the house, which supplies air to the rooms whenever their doors are opened, though of course there should be means of shutting it off in summer, when it might prove rather a nuisance than otherwise.

Trusting then that soon, if it be not already achieved by any of the grates shown in this exhibition, that most desirable end, the consumption of smoke within the grate itself will be successfully carried out, I conclude these few observations upon the construction of chimneys, waiting discussion thereon from the members of this Conference.

IS TRAP VENTILATION A MISTAKE?

IT is worth while to give as much currency as possible to the *Sanitary Engineer's* disparaging remarks on Mr. Putnam's report to the Boston Board of Health, as, setting aside all questions of personal rectitude, the matter is of much real interest to the public as it affects both its pecuniary and sanitary welfare,— of the upper classes at least.

The question is simply, Is trap-ventilation a necessity?

The *Sanitary Engineer*, with much emphasis, says that it is, and Mr. Putnam says, just as emphatically, that it is not. The *Sanitary Engineer* has for years been committed to the advocacy of the efficiency of trap-ventilation, and has been a most active and successful promoter of the trap-vent laws now enforced by many boards-of-health, and if it would consent to modify its efforts, so that a reasonable discretion in the use of trap-vents should be allowed to practitioners of at least equal intelligence and experience with those of the conductors of that journal, we would most cordially agree that its untiring efforts in this direction had been productive of great good. But until we are prepared to admit that the devisers and framers of "cast-iron" laws on any subject have absorbed the sum and substance of all past, present and future knowledge of the subject of such legislation, and that all the rest of mankind have only intelligence enough to do as they are told to do, we shall consider that the "last word" on any subject has not been said, so long as there exists a man who can formulate a reasonable and intelligent adverse conclusion. In the matter of sanitary science, particularly, we stand ready to retract, modify or reaffirm any statements we have made or may make, according as the future advances made in the science may require.

We have private information which leads us to believe that the *Sanitary Engineer* opposes Mr. Putnam's conclusions, and maintains its belief in trap-ventilation as the *summum bonum* of sanitary science, not only because it would be disagreeable for its editor to recant, but that it does so as a mere matter of expediency. That is, it believes that the evils which certainly arise from trap-ventilation are of less consequence than those which would arise from the absence of such ventilation. To a degree the championing of trap-ventilation as a measure of expediency is defensible; but the position can be maintained with dignity, without asserting that it is not possible to achieve the same security by other means, or by indulging in reflections on the character of those who differ from it. To us it seems that it would be a higher aim to search out and declare the whole truth, rather than to stop short at an expediency.

The *Sanitary Engineer* in its last issue, makes its apologies to Mr. Putnam for its flings at his character, but in so doing ingeniously contrives to convey the impression that Mr. Putnam has done something which he really ought not to have done. The argument that an investigator cannot make an honest investigation if he have an interest in the result would have a singular application to any past investigation or discovery.

Mr. Putnam did *not* "place himself before the public as an expert endeavoring to introduce an improvement in sanitary appliances"; he appeared before the public as an investigator during whose authorized investigations a discovery was made, which he was as clearly entitled to benefit by as is the journeyman who discovers a means of improving his master's machinery on which he is at work.

The heinousness of the crime appears to lie in the success of the discovery. Other patent traps were, as stated, tested by Mr. Putnam at the request of the Board of Health, though the action of pot-traps was the special subject of inquiry, and we are willing to believe that had any of them stood the tests as satisfactorily as did his own, the fact would have been duly recorded in the Report.

We think, too, that whatever may have been the defects of the apparatus, or the bias of the observer, the value of the tests as comparative records, made under similar circumstances, need not have been passed over in silence.

Turning to our own remarks, the *Sanitary Engineer* says: —

"In this connection we notice that the *American Architect and Building News*, in its last issue, expresses indignation at our treatment of the case, and is evidently but poorly informed on the subject. We are complained of for not having "investigated both sides," when we were not aware that any controversy existed."

As to our being "poorly informed," it might have been guessed that, even supposing the source of our information to be Mr. Putnam, our information was better than its own, seeing that we had the benefit of Mr. Putnam's statement, *plus* those which the *Sanitary Engineer* puts forward as the statements of the other interested parties. We may also say that we were unaware that an "investigation" could be made only of a matter in "controversy," and also that in nature, as in logic, things have usually more "sides" than one.

It then continues: —

"The *Architect* thinks 'Mr. Philbrick and Mr. Bowditch made a mistake in withdrawing their assistance.' The fact is, these two gentlemen were never employed in the case by any one. They consented, at the request of the Chairman of the Board of Health, and Mr. Putnam, to be present at some experiments, merely as a personal favor to these gentlemen, having had no voice in the preparation of the apparatus. They soon found that this apparatus was, in their opinion, so defective that no value could be attached to the results, and they so reported to the Board of Health at once."

If Messrs. Philbrick and Bowditch — we regret exceedingly to drag their names into the discussion — "were never employed by any one," as any one who reads the article in the *Sanitary Engineer* of August 7 would certainly be justified in thinking they were "employed" by the Board of Health, why was it sought to clothe the action of these private individuals with a glamor of officialism, and why should Mr. Putnam solicit their signatures to his report, and why, again, should these gentlemen have "so reported to the Board of Health at once"?

We freely admit that this rejoinder is just about as disingenuous as the *Sanitary Engineer's* manner of replying to our criticism of the action of these gentlemen.

The *Sanitary Engineer* then goes on to say that: —

"The *Architect* further states that the criticism made by these gentlemen concerning the defects in the apparatus is a 'quibble,' and 'an old tale of disagreeing doctors. On the one side stand Philbrick, Bowditch and the *Sanitary Engineer*, on the other Putnam and Waring. Whether a quibble or not, further experiments will doubtless show. But we doubt if Col. Waring, or any other sanitarian of good sense and experience, will advocate the construction of four-inch branches in a soil-pipe, without extending them of full size to the open air. If he or any other 'doctor' does so, we shall certainly disagree with him and let the case stand on its merits."

Our arraying of Messrs. Putnam and Waring against Messrs. Philbrick, Bowditch, and the *Sanitary Engineer*, was not, as is here made to appear, on the matter of what was "good practice," and whether the apparatus used fell under that head, but was done simply because the subject is one of trap-ventilation or no trap-ventilation, and we arrayed in this way the most pronounced advocates of either system. We do not see why Colonel Waring is here set up as a man of straw, only to be knocked down for advocating a method of construction which, so far as we know, it has never entered his mind to carry out.

The reply then closes as follows: —

"We would recommend to the editor of the *Architect* to try the experiment himself, as to the difference between a two-inch and a four-inch branch under the circumstances referred to before taking such a decided tone in condemning our reasoning, which we still believe to be correct. Its accuracy can be proved by any candid person who cares to make the trial. We stated that four and one-half gallons of water "would form a solid piston in a four-inch pipe seven feet in length, or longer if somewhat scattered," and we are not inclined to abate a single inch of this statement, which any one can verify in five minutes. If we assumed from Mr. Putnam's diagram that it fell some forty feet, when it actually fell only twelve feet, the scattering would be much less than we supposed probable."

We do not recognize in our previous remarks the "decided" tone about the 4″ x 4″ branch, which is here objected to. We did suggest the possibility of a *reductio ad absurdum*, but then it was a very modest suggestion, with little that was didactic or "decided" about it.

If the *Sanitary Engineer* or the gentlemen who support its views, will put themselves squarely on record as to how far this 4″ x 4″ branch vitiated the results obtained by Mr. Putnam, theoretically or practically, we will then furnish them with an account of the experiment it here advises our making.

We make this suggestion or challenge, simply because after two months consideration the upholders of the trap-vent law have been able to challenge the credibility of Mr. Putnam's elaborate experiment and the justness of his conclusions in only two particulars, the style of closet used, and the use of the 4″ x 4″ branch; all else appears to be satisfactory beyond criticism. It is therefore a matter of considerable interest to the parties to the discussion, and still more so to the public, that the question having been narrowed down to this point should be settled definitely, now and at once.

Either the presence of the 4″ x 4″ branch was a great defect, and produced such serious practical effects that the conclusions from the experiments must be admitted to be valueless, or else the presence of this branch produced no practical effect on the experiments, or such effects as were only in favor of the trap being tested. If the first position, that upheld by the *Sanitary Engineer*, can be maintained, then one of the arguments against trap-ventilation, to wit: that the vent-pipe fails to fulfil its purpose, must await further demonstration, and until such time the public must pay for its trap-ventilation. But if it can be proved that the 4″ x 4″ branch (the use of which is really the only point that has been assailed) did not practically affect the results, then Mr. Putnam's conclusions are seemingly beyond attack, and the public should learn at once that trap-ventilation is not the safeguard it is asserted to be.

We never denied that "4½ gallons of water in a 4-inch pipe would form a solid piston seven feet in length," although we had not calculated the cubic contents of seven feet of 4-inch pipe; but our disbelief in the continued solidity of this seven foot piston after a fall of forty feet, is not exactly shaken by finding the statement reiterated as above, with the important omission of stating at what point of its fall it is now to be measured. As an expression of concomitant condition of matter, a "somewhat scattered" solidity is worth noting for future use.

COPY OF AGREEMENT WHICH THE MASTER PLUMBERS' ASSOCIATION WISHES THE DEALERS AND MANUFACTURERS TO SIGN, AND THEIR REPLY.

Propositions presented to the Associations of New York and Brooklyn, and adopted unanimously:

I. *That the Manufacturers and Dealers in Materials* shall not sell to others than *Licensed Plumbers* who shall exhibit a *Certificate duly signed* by the *President and Secretary* of their respective Association. *This Certificate* guarantees that *such Plumber* is entitled to all privileges, and be renewed every three months. Approved.

II. *That no Manufacturer or Dealer shall figure on Plans or Specifications* for any person, whether engaged in the *Plumbing Business* or not. Approved.

III. *That no Plumber, Manufacturer or Dealer in Patented Articles* shall sell to others than *Licensed Plumbers* as stipulated in Article I. Approved.

IV. *That any Plumber who waives his discount in favor* of his Customer shall be dealt with *as one not entitled* to the regular *Trade Discounts*, and his *Certificate* shall be revoked and remain so until he be properly reinstated and *receive a new Certificate from his Association.* Approved.

V. *That Manufacturers and Dealers shall not furnish* Repairs, or do the same, except through a *regularly Licensed Plumber.* Approved.

VI. *That Manufacturers and Dealers shall not become Sureties for the fulfilment of any Plumbing Contract.* Approved.

VII. *That where Manufacturers and Dealers require Security* from Plumbers, such Security shall not be accepted from any interested party, *whether Owner or Contractor.* Approved.

VIII. *Agents of Manufacturers and Dealers shall be prohibited* from selling Plumbing Goods to any person other than those stipulated in Article I. Approved.

IX. *That the Manufacturers and Dealers pledge themselves* not to sell or deal with any person or persons other than those stipulated in Article I. Approved.

THE MANUFACTURERS' REPLY.

MR. A. YOUNG, *Chairman National Association Master Plumbers of the United States*: —

Dear Sir, — We much regret the receiving from your Association the set of resolutions which we now most respectfully return. We regret it for the simple reason that we do not like to feel that a document so untenable, so unbusinesslike, so opposed to all the established laws of commerce and trade, both written and unwritten, should have emanated from your body, and which, were it possible to carry into effect, would not only, in our opinion, be ruinous to your business, dishonorable to yourselves, but would place you in the very unenviable light of extortionists, before the eye of the public. To say that we cannot give it any consideration seems almost like reiteration; nor can we yet believe that it represents the intelligence, or that it is the result of the thoughtful and deliberate majority of your craft.

We further regret the position you have placed us in, as we are most desirous of furthering the interests of the plumbing trade, recognizing how largely our interests are mutual. Why you, as intelligent men, do not see and appreciate this fact, we are at a loss to explain; it cannot be possible that you so underrate our business ability and common-sense that you imagine we cannot see that the most friendly and intimate relations with the plumbing trade is to be desired by us above all things. Furthermore, we must embrace

this opportunity of stating *most distinctly* that we find no just cause for any *special protection* other than that which the usual and accepted laws of commerce accord alike to all. That misunderstandings do occur, that there should be friction sometimes, is only in the nature of all human things, and no set of resolutions can make it otherwise; but why these matters cannot be adjusted by the usual business methods in the future, as they have been in the past, we fail to see.

Finally, let us ask you, and believe that we do so in the most friendly spirit, do nothing rashly; confer with the less impulsive and conservative members of your Association; also, remember that a great deal of good may result from mutual confidence and friendly intercourse, while combinations, threats, and such like, will only tend to provoke opposition. And let each one, whether Buyer, Maker or Dealer, look to a well-earned reputation for upright and honorable dealing as the only lasting and safe protection of their interests.

Respectfully yours,

Fred Adee & Co.,	Durham House Drainage Co.,
Abendroth Bros.,	Wm. H. Hussey,
Myers Sanitary Depot,	Staats & Dillmeier,
Tatham & Brothers,	Henry Huber Co.,
The J. L. Mott Iron Works,	Williamsburgh Lead Pipe W'ks,
McNab & Harlin M'f'g Co.,	The E. G. Blakslee M'f'g Co.,
The Meyer Sniffen Co., Limited,	L. Waefelaer Co., Limited,
Mayor, Lane & Co.,	Geo. D. Kimber & Son,
Chas. Harrison & Co.,	Cassidy & Adler,
Miller & Coates,	Jamer, Jacobs & Co.,
Ronalds & Co.,	Thomas Maddock & Sons,
Henry Steeger & Co.,	Peck Bros. & Co.,
Jochum & Jetter,	David Morrison,
James Bulger, Jr.,	The Le Roy Shot & Lead M'f'g Co.,
Theodore Susemihl,	Hunter Keller M'f'g Co.,
L. Brandeis & Son,	Bird, Faulkner & Co.,
J. Trageser Steam Copper W'ks,	T. R. McMann & Bro.,
Colwell Lead Co.,	J. C. Bryan,

Henry McShane & Co.

A QUESTION OF CUSTOMARY PRACTICE.

Savannah, Ga., Aug. 18, 1884.

To the Editors of the American Architect: —

Dear Sirs,— Will you be kind enough to inform me through the columns of your valuable paper the customary practice of the profession in the following case? I was employed, by Mr. H., to design and erect a residence at the usual five per cent; he was to supply the grates and mantels, but the contractor was to set them. He intended getting mantels from the dealers, but changed his mind during progress of the work, and requested me to make designs for the six mantels required, and to see that the contractor carried out the drawings. Now the point I wish to ascertain is, have I the right to charge extra for this work, or should the five per cent commission cover it, no extra bargain being made with Mr. H., he simply giving me the order to have the mantel drawings prepared and the work of making them superintended? Very truly yours, J. J. N.

[This mantel question is a rather vexed one, but we will give the same answer that we gave once before, apparently with the approval of the profession generally. This answer is: That, although mantels by themselves are to be classed as furniture, and cannot profitably be designed and the execution supervised, for a smaller charge than ten to twenty-five per cent on the cost, or even more, it is nevertheless customary for architects to include the designing of the mantels for their buildings, or the selection, which is worth quite as much, in the general commission of the building. J. J. N.'s case is different from most, as his original agreement was to design and supervise the work without mantels; and his client, in requesting him to undertake them as a separate matter, probably expected and intended to pay him suitably for his trouble. But we think he would do best to show his amiable feeling toward his client, and his interest in the house, by making his charge for the mantels as near the five per cent, to which he would, of course, be entitled, as he could without actual loss. — Eds. American Architect.]

FOR THE BENEFIT OF ARCHITECTURE IN AMERICA.

Des Moines, August 19, 1884.

To the Editors of the American Architect: —

Dear Sirs, — There appeared in your issue of May 17th, a column of letters in reply to your "open letter on competitions."

Architecture will be benefited in America by your publishing, as a contrast, the following letter, received by the D. M. Association, endorsing the more civilized, Continental, "intensely" anti-British, but not yet American system of demanding competent judges of architectural competitions.

[Copy of letter.]

St. Paul, Minn., August 9, 1884.

Mr. E. H. Taylor, *Sec'y Architectural Ass'n, Des Moines.*

Dear Sir, — Your several circulars concerning professional practice and competitions among architects were received several days ago.

I wish to say that I heartily accord with the principles you enunciate, and have been, will, and am doing all I can in my private way to forward the ends desired.

I believe that by a dignified, consistent course of action; a careful self-cultivation in the principles of design and construction; and a positive refusal to subordinate principles to money-getting; together with a realization of the fact that architects as well as the general public are apt to be wrong, which should keep us ready to judge of all things with unbiased minds, will, in a near future, enable us to gain our point, and elevate our art. Yours sincerely, ——

This letter has the ring of good metal in it. Any such metal you may have in *New* England, we shall be glad to see at Chicago this fall. D. M. A.

NOTES AND CLIPPINGS.

A Trades-Union Outrage. — The *Metal-Worker* says that a horrible union outrage occurred at Bradford, Pa., a short time ago. The glass works at that place, which have been shut down for a month, were about to be reopened with non-union men. A French foreman had been engaged, and on the day mentioned he and two others were at the works. The union men previously employed are Belgians. A gang of them suddenly attacked the works, secured the French foreman, and deliberately gouged out his eyes, lacerating the eyeballs in a terrible manner, but inflicting no other injury. He will lose both eyes, and will probably die. One of the strikers said that the non-union men would be helpless without the aid of the foreman, who was a skilled workman; therefore they put out his eyes. Five of the strikers were arrested, and warrants are out for sixteen more. Such an outrage is calculated, we should suppose, to sensibly diminish the "respect" that Mr. John Beverly Robinson entertains for the methods of strikers.

Burning of the Royal Armory, Madrid. — The recent burning of the Royal Armory, at Madrid, is a calamity the full force of which will be most appreciated in the world of art, which by the catastrophe sustains irreparable losses. The armory occupied one wing of the great palace, which is a pile of granite and white stone, 470 feet square and 100 feet high, with a central court 240 feet square. The collection of armor was, beyond compare, the finest in the world. Superb coats-of-mail of all epochs, cunningly wrought by master artificers; armor on which had been expended the treasures of the artist's imagination and all his wonderful resources of skill; shields wrought by the geniuses of Augsburg, Florence and Milan, the best and most complete collection in existence of Toledo and Damascus blades — these were but a part of the peculiar furnishings of the great armorial hall of the Alcazar. In addition to the display of armor, there were treasures from the easels of the old masters of painting, Velasquez, Tintoretto, Murillo, Paul Veronese, Rubens and other names no less famous being here represented by works of surpassing beauty and grandeur. The greatest number of paintings in the palace, however, are in the picture-gallery at some distance removed from the armory, and these art treasures have probably escaped uninjured. It is to be hoped that the earlier reports of damage by the flames will prove exaggerated. — *Metal-Worker.*

Excavations at Zoan. — A few weeks ago, Mr. Petrie reported the discovery at Tanis in the Delta (Zoan of the Bible), of a "colossus of colossi," exceeding in size any human statue of which there is record — of hard granite and higher, if placed erect, than the nave of Westminster Abbey. Now he reports among many interesting unearthings, the finding of a huge granite sarcophagus in a royal tomb. It is 14½ feet in length, 7 feet and 9½ inches in width, and 8 feet in height, or considerably larger than the famous sarcophagus of the Apis in the Serapeum at Sakkarah, near Cairo. Near by, a portion of a black granite sphinx bore the cartouche of Rameses III, the first king in the dynasty succeeding that of the great oppression of the Israelites. The able and successful labors of Mr. Petrie at Zoan are followed by many people with deep interest, and his report in full of nearly five months' labor at Zoan, soon to be given at the general meeting of the Egypt Exploration Fund Society, will be a highly valuable archæological and historical document. The appeal for aid by Rev. W. C. Winslow, of Boston, has met with a cordial response from men representative of scholarship and official station. The undertaking is a vast one, such as only a Petrie, a Naville or a Maspéro can properly manage, and cause to yield rich results. The explorations will be resumed in the autumn. — *Springfield Republican.*

Patent Fuel in France. — The United States Commercial Agent at Nantes says that the coal dust, which was formerly rejected as worthless, is now consumed in immense quantities in France in the form of "patent fuel," or coal bricks. The natural supply of dust from the yards of the coal merchants being entirely insufficient for the needs of the brick works, the manufacturers, particularly in the Nantes district, import a large quantity of coal-dust from Cardiff, Swansea and Newport. The process of manufacture is very simple. The coal-dust is mixed with pitch, and the mixture poured into cups attached to a belt, each cup containing just enough material for a brick of the size desired. The belt in its movement passes this material through a chamber where it is exposed to steam which fuses the two substances into a homogeneous mass. This is poured by the descent of the belt into moulds, where it is subjected to an enormous pressure by a hydraulic press or by machinery set in motion by a steam-engine. The brick is square in form, its thickness being about one-third of its other dimensions, and it weighs five, ten or fifteen pounds. Certain of the French railway companies refuse to accept fuel unless at least ten per cent of pitch has been used for its agglomeration. It is stated that *briquettes* are preferable to ordinary coal for exportation to the colonies and to warm climates on account of their compact storage and freedom from small fragments and dust, also for use on locomotives, both on account of economy and space, and because firemen can always determine the amount of fuel they are employing in a given time, the weight of each brick being exactly known. The manufacturers claim that the "patent fuel" is more healthy for domestic use than ordinary coal, citing in support of this theory the declaration of certain well-known physicians. At the present day a number of bricks are made for domestic use, of small size, and perforated with circular or longitudinal openings. — *Journal of the Society of Arts.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

303,610. KNOB ATTACHMENT. — James Reuben Binns, South Windham, Conn.

303,615. PIPE-JOINT PACKING. — Cotter T. Bride, Washington, D. C.

303,623. CHIMNEY-CAP. — Robert H. Craighill, Buffalo, N. Y.

303,633. FRICTION-HINGE. — Wm. E. Gard, Meriden, Conn.

303,636. SAFETY-BOLT. — Perkins A. Gordon, Milan, Conn.

303,638. FIRE-ESCAPE. — Arthur H. Hall, Chicago, Ill.

303,640. SINK-TRAP. — Benjamin Holland, Jr., Providence, R. I.

303,647. VISE ATTACHMENT. — Theodore E. King, Westport, Conn.

303,654. WINDOW-BEAD FASTENER. — David Carruthers McGregor, East Oakland, Cal.

303,666. COMBINATION-TOOL. — Fred'k W. Ritchie, Vanceborough, Me.

303,667. STEAM-HEATING APPARATUS. — Charles W. Rugg, Cambridge, Mass.

303,685. AWNING. — Nelson S. White, Canton, and James E. Stevens, Stoughton, Mass.

303,707. DISINFECTING APPARATUS FOR WATER-CLOSETS. — Edward Mason Chase, Boston, Mass.

303,709. BRICK-MACHINE. — Samuel P. Crafts, Hamden, Conn.

303,712. VALVE FOR WATER-CLOSETS. — John Demarest, New York, N. Y.

303,730. SASH-CORD FASTENER. — Frederick S. Heiser, Brooklyn, N. Y

303,741. SASH-HOLDER. — John N. McGriff, Anderson, Ind.

303,752. MONKEY-WRENCH. — Gustavus B. Sanborn, Bristol, N. H.

303,765. SAFETY DEVICE FOR HOT-WATER BOILERS. — Wm. A. Tracy, Philadelphia, Pa.

303,792. BURGLAR-ALARM. — Emil Baumbach, New York, N. Y.

303,822. SAFETY FLUID-TRAP. — Rudolph D'Heureuse, New York, N. Y.

303,830. PORTABLE CAISSON FOR USE IN BUILDING SUBAQUEOUS STRUCTURES. — Henry Flad, St. Louis, Mo.

303,846. WATER-CLOSET VALVE. — Wm. J. Hearn, New York, N. Y.

303,856. COMBINATION FIRE-PROOF ARCH. — Henry G. Isaacs, St. Louis, Mo.

303,858. BASIN-TRAP CLEARER. — James E. Kelsey, Brooklyn, N. Y.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report twenty-two permits have been granted, the more important of which are the following: —

E. S. Dillon, two-and-one-half-st'y brick building, s s Baltimore St., e of Payson St.

Aug. Hanneman, 9 two-st'y brick buildings, e s Ann St., bet. Chase and Biddle Sts.

Jacob Gerwig, 13 three-st'y brick buildings, w s McCulloh St., bet. Gold St, and North Ave.

Emily J. Cromer, 6 two-st'y brick buildings, n s Preston Pt., com. n e cor. Valley St., and two-st'y brick building e s Valley St., n of Preston St.

George Gogel, 2 three-st'y brick buildings, n e cor. Fulton and Patterson Aves.

Geo. Worick, 2 two-st'y brick buildings, e s Ensor St., s of Hoffman St.

J. H. Sudrink, three-st'y brick building w s Belair Ave., n of Oliver St.

Boston Fear, 2 two-st'y brick buildings, w s Bruce Alley, s of Presstman St.

Clement Smith, three-st'y brick building (square), s s Preston St., bet Eutaw St. and Linden Ave.

Boston.

BUILDING PERMITS. — *Brick.* — *Thatcher St.*, rear No. 3, Ward 7, for Rutland Marble Co., stable, 20′ and 22′ x 24′ and 29′, two-st'y flat; John Keeley, builder.

Wood. — *Sycamore St.*, near Ashland St., Ward 23, for Robert Wright, dwell., 15′ x 15′ and 24′ x 28′ 6″, two-st'y pitch; Chandler, Gilman & Jones, builders.

Water St., No. 7, Ward 5, for Moses Pond & Co., storage, 12′ x 40′, one-st'y pitch; A. R. Nickerson, builder.

Washington St., opp. Allston St., Ward 25, for Samuel S. Leonard, milk room, 12′ x 27′, one-st'y pitch; Stephen Holmes, builder.

Union Ave., near Green St., Ward 23, for Patrick McDonald, 2 dwells., 6′ x 36′ and 12′ x 16′, two-st'y pitch; Geo. A. Cahill, builder.

Tremont St., No. 1601, Ward 22, for Daniel J. O'Keefe, dwell., 25′ x 57′ 6″, three-st'y hip.

Taylor Ct., off River St., opp. Temple St., Ward 24, for John Taylor, stable, 24′ x 58′, one-st'y pitch; John Taylor, builder.

Neponset Ave., near Commercial St., Ward 24, for Silas Putnam, dwell., 20′ x 28′, one-st'y pitch; H. P. Oakman, builder.

Bennett St., rear, near Parsons St., Ward 25, for Pierce Quirk, stable, 20′ x 28′, one-st'y pitch.

Enfield St., rear, near Hazel St., Ward 23, for Warren J. Stokes, stable, 20′ x 24′, two-st'y pitch; Warren J. Stokes, builder.

Baker Pl., rear, off Baker St., Ward 23, for Wm. Cronin, stable, 15′ x 20′, one-st'y pitch; Dennis Cronin, builder.

Moore St., near Saratoga St., Ward 1, for Geo. C. Doyle, dwell., 21′ x 30′, two-st'y flat; G. V. Goodwin, builder.

Unnamed St., off Florence St., opp. Handcock St., Ward 23, for John Richardson, coal-shed, 30′ x 100′, one-st'y pitch.

Salem St., near Basto Pl., Ward 23, for Samuel W. Bridge, dwell., 12′ x 14′ and 21′ x 30′, two-st'y pitch.

Poplar St.; cor. Charles St., Ward 23, for Chas. J. Page, dwell., 24′ x 34′, two-st'y pitch; John Alden, builder.

Baker Ct., rear, near Dorchester Ave., for Henry L. Pierce, stable, 30′ x 50′, two-st'y pitch; Jas. Pope, builder.

Seaver St., near Walnut St., Ward 21, for F. W. Dahl, stable, 30′ x 40′, two-st'y mansard; Valentine Bock, builder.

Attwood Ave., rear, near Day St., Ward 22, for Sarah H. Seaverns, dwell., 14′ x 18′ and 26′ x 33′, two-st'y hip; A. Cassidy, builder.

Brooklyn.

BUILDING PERMITS. — *Eighth St.*, n s, 901′ 10″ w Sixth Ave., one-st'y brick church, slate roof; cost, $10,000; owner, Hanson Pl. M. E. Church, cor. Hanson Pl. and St. Felix St.; architect, John Mumford; builders, J. Ashfield & Son and Morris & Selover.

Berkeley Pl., No. 220, three-st'y and basement brick dwell., tin roof, iron cornice; cost, $10,086; owner, Mrs. C. S. Brakeley, 451 West Twenty-first St., New York; architect, John Sexson; builder, James K. Spratt.

Broadway, No. 1029, n e cor. Lafayette Ave., three-st'y store and tenement, tin roof; cost, $9,165; owner, Peter D. Kenney, 192 Devoe St.; architect, Th. Engelhardt; builders, Geo. F. Cutler and R. B. Ferguson.

Nineteenth St., n s, 415′ w Third Ave., two-st'y frame straw hat factory, tin roof; cost, $2,800; owner, Elizabeth Parsons, Thirty-ninth St., cor. Second Ave.; architects and builders, Spence Bros.

Broadway, No. 781, e s, 25′ s Wall St., three-st'y store and dwell., tin roof; cost, $7,000; owner, J. M. Otto, 453 Grand St.; architect, Th. Engelhardt.

Broadway, No. 779, s e cor. Wall St., three-st'y brick store, office and dwell., tin roof; cost, $9,000; owner, etc., Th. Engelhardt, 16 Fayette St.

Manhattan Ave., w s, 100′ s Calyer St., four-st'y brick store and tenement; cost, $8,500; owner, Isaac Abrams, on premises; architect, Frederick Weber; builder, M. Smith.

Nassau Ave., s s, between Leonard and Eckford Sts., 12 three-st'y brick tenements, tin roofs; cost for all, $45,600; owner, John Englis, Sr.; architect, Fr. Weber; builders, John B. Woodruff and S. F. Bartlet.

Rodney St., s s, 144′ w Bedford Ave., 2 three-st'y brown-stone dwells., tin roofs, wooden cornices; cost, each, $6,000; owner and builder, James Haughran.

Franklin Ave., s w cor. Bergen St., four-st'y brick store and tenement, tin roof; cost, $12,000; owner, Christian Schimersal, 669 Pacific St.; architect, A. Herbert; builder, Jacob Schoch.

Myrtle Ave., n s, 100′ e Lewis Ave., two-st'y brick stable and hay-loft, felt and gravel roof; cost, $15,000; owner, Brooklyn City R. R. Co., 10 Fulton St.; architect, A. W. Dickie.

Newel St., w s, 366′ n Van Cott Ave., three-st'y frame (brick filled) tenement, gravel roof; cost, $4,300; owner, F. Thos. Aspern, New York; architect, Fr. Weber; builders, Port & Walker.

Madison St., n s, 200′ e Stuyvesant Ave., 3 two-and-one-half-st'y brown-stone dwells., tin roofs; cost, $4,000 each; owner, G. DeRevere, 663 Greene Ave.; architect, Amzi Hill.

Private St., between Baltic and Butler Sts., 115′ w Third Ave., 24 two-st'y brick dwells., gravel and felt roof; cost, each, $2,500; owner, James W. Dearing, 434 Henry St.; architects, Partitt Bros.

Eleventh St., s s, 197′ e Fourth Ave., 6 two-st'y brick dwells., tin roofs; cost, each, $3,500; owner and builder, C. B. Sheldon.

Chicago.

BUILDING PERMITS. — St. Aloysious Church and School, 495-501 Davis St.; cost, $12,000; architect, D. Bess.

Mrs. M. O'Brien, two-st'y stores and flats, 240 North Market St.; cost, $4,000.

D. Culrich, two-st'y flats, 467 Superior St.; cost, $2,500, builder, A. Kollhurst.

Archbishop Feehan, barn, 615 North State St.; cost, $20,000; architects, Willett & Bashley; builders, Robinson & Miner.

M. Mooney, two-st'y store and flats, 2358 Cottage Grove Ave.; cost, $6,000.

C. Silet, cottage, 187 Bissel St.; cost, $2,700.

W. A. Passarant, three-st'y hospital, 188-192 Superior St.; cost, $25,000; architect, Charles Birkner, builders, Sleinmetz & Eilenberger.

D. Levy, two-st'y flats, 17 Cornelia St.; cost, $4,700.

J. Jancek, three-st'y flats, 760 Allport Ave.; cost, $4,400.

J. Wilimosky, three-st'y store and flats, 593 Blue Island Ave.; cost, $8,000; architect, P. W. Reihl; builder, A. Lula.

R. Ruble, two-st'y dwell., 233 Ashland Ave.; cost, $10,000.

W. R. Loveland, three-st'y flats, 205 Third Ave.; cost, $5,000.

J. Devoos, two-st'y dwell., 191 Racine Ave.; cost, $2,500.

P. Hardy, three-st'y store and flats, 383 Maxwell St.; cost, $8,000; architect, J. W. Warner.

McCormick Harvester Co., three-st'y warehouse, Leavitte St.; cost, $25,000.

D. A. Titcomb, two-st'y flats, 12 Plumb St.; cost, $3,500; architect and builder, W. J. B. Hunter.

A. & V. Delp, 2 cottages, 722-724 California Ave.; cost, $3,000.

M. Mulvey, two-st'y dwell., 337 West Huron St.; cost, $3,000.

C. W. Boynton, three-st'y dwell., 388-390 Ontario St.; cost, $10,000.

Thos. Murphy, cottage, 464 Dayton St.; cost, $2,600.

J. Rachy, two-st'y dwell., 492 Superior St.; cost, $4,000; architect, E. Saudelbach.

P. Metzger, two-st'y store and dwell., cor. Thirty-first and Wall Sts.; cost, $4,500.

T. B. Blair, 3 cottages, 3616-3620 Lasalle Ave.; cost, $4,500.

O. Meller, two-st'y dwell., 314 Twenty-second St.; cost, $4,600; architect, T. Frank; builder, C. Spoor.

W. H. Knox, three-st'y flats, 873 Van Buren St.; cost, $6,000.

Turner & Bond, 4 cottages, Idaho St.; cost, $6,400.

H. H. Porter, two-st'y addition, 311 Erie St.; cost, $2,500; builder, L. Dweich.

F. B. Clarke, 5 two-st'y dwells., 59-65 Robey St.; cost, $8,000; architect, R. Ray; builders, Geo. Lehman & Son.

J. P. Bell, two-st'y dwell. and store, 621 North Clark St.; cost, $3,500.

R. & D. Gibson, two-st'y dwell., Washtenaw Ave.; cost, $3,000.

Cincinnati.

BUILDING PERMITS. — W. Fair, three-st'y brick building, Bair St., between Mound and Cutler Sts.; cost, $5,000.

J. Bergfeld, three-st'y brick building, w s of Sycamore St., between Woodward and Franklin Sts.; cost, $3,000.

Ph. Paul, two-st'y brick building, Fort Ave., between James and Rachael Sts.; cost, $3,600.

J. H. Wolf, three-st'y brick building, e s Kendell Ave., between Bank and Central Aves.; cost, $4,000.

A. N. Roberts, addition, 298 Vine St.; cost, $3,200.

M. A. Nathan, three-st'y brick building, 330 West Sixth St.; cost, $5,000.

Louis Shutz, three-st'y brick building, e s State Ave., between Storrs and Stable Sts.; cost, $4,000.

Wm. Strekamp, three-st'y brick building, e s State Ave., between German and River Road; cost, $3,000.

Total cost, $30,800.

New York.

STORE. — For Mr. M. H. Rosenstein, a six-st'y and basement store, 23′ x 130′, iron front, is to be built at No. 102 Bleecker St., at a cost of about $65,000, from designs of Mr. Alfred Tucker.

FLATS. — On the n e cor. of First Ave. and Eighty-third St., 5 five-st'y brick, brown-stone and terra-cotta flats, three 25′ x 70′, one 27′ x 85′, and the other 26′ x 85′, are to be built at a cost of about $80,000, by Mr. P. Braender, from plans of Mr. John Brandt.

At No. 385 First Ave., a five-st'y brick and stone flat, with store, 25′ x 81′, is to be built by Mr. W. B. Boyd, at a cost of $18,000, from designs of Mr. J. Hoffmann.

On the s s of One Hundred and Thirty-third St., 80′ e of Madison Ave., 2 five-st'y brick, brown-stone and terra-cotta flats, 27′ 6″ x 76′ each, are to be built at a cost of $35,000, for Mr. Frank M. Clemens, from designs of Mr. J. Brandt.

BUILDING PERMITS. — *Bergen Ave.*, w s, 49′ s One Hundred and Fifty-third St., three-st'y frame tenement, tin roof; cost, $3,500; owner, George Urstadt, North Third Ave., cor. One Hundred and Fifty-third St.; architect and builder, J. C. Stichler.

West Fifty-seventh St., No. 517, three-st'y brick stable, tin roof; cost, $25,000; owner, Conrad Stein, 221 West Fifty-seventh St.; architect, J. Kastner.

Madison or Bathgate Ave., w s, 100′ n One Hundred and Eightieth St., two-st'y frame dwell., tin roof; cost, $2,700; owner, Auguste J. Paris, 2058 Vanderbilt Ave., Twenty-fourth Ward; architect, W. W. Gardiner; builder, J. Knox.

Ave. A, w s, 79′ 5″ s Fifty-eighth St., five-st'y brick tenement, tin roof; cost, $10,000; owners, P. & J. F. McManus, 161 East Fifty-seventh St.; architect, J. H. Valentine; builder, J. F. McManus.

Fourth Ave., n e cor. One Hundred and Twenty-eighth St., 2 four-st'y brick tenements and carriage-shop, gravel roofs; cost, $10,000 and $12,000; owner, Chas. C. Schildwachter, 77 East One Hundred and Twenty-fifth St.; architect, B. Walther.

St. Nicholas Pl., e s, 50′ n One Hundred and Fifty-first St., four-st'y stone, brick and terra-cotta dwell., slate and tin roof; cost, about $30,000; owner, M. Van Rensselaer, 141 East Thirty-seventh St.; architect, C. Pfeiffer; builder, F. Lyons.

Water St., Nos. 640 and 642, 2 five-st'y brick tenements, tin roofs; cost, each, $9,000; owners, Hedwig Hafker, 273 Delancey St., and Leonard G. Preusch, 86 Cannon St.; architect, J. Boekell; builder, H. Hafker.

Tenth Ave., No. 128, five-st'y brick tenement, tin roof; cost, $18,000; owner and architect, Matthew Colligan.

Second Ave., s w cor. One Hundred and Twenty-eighth St., 4 five-st'y brick tenements and stores, tin roofs; cost, each, $16,000; owners, Alexander P. Ketchum, 32 Mt. Morris Ave., and others; architect, Geo. Martin Huss.

St. Nicholas Pl., w s, 50′ 10″ n One Hundred and Fifty-sixth St., three-st'y stone and frame dwell., tin roof; cost, $5,000; owner, Henry Moll, 1576 First Ave.; architect, John Brandt.

One Hundred and Tenth St., n s, 125′ e Fourth Ave., 4 five-st'y brown-stone front tenements, tin roofs; cost, each, $20,000; owner, John Van Dolsen, Bedford Flats, Eighty-second St., cor. Tenth Ave.; architect, A. Spence.

One Hundred and Fifty-ninth St., s s, 200′ w Elton Ave., three-st'y brick and frame dwell., tin roof; owner, Mary Ogden, 1049 Washington Ave.; builders, John Freese and Alex. Weir.

Morris Ave., s e cor. One Hundred and Forty-sixth St., three-st'y frame dwell. and store, tin roof; cost, $3,250; owner, Theresia Tompkins, 576 East One Hundred and Forty-fifth St.; architect, H. S. Baker; builder, Ed. Gustaveson.

West Seventy-second St., Nos. 418, 420, 422, 424 *and* 426, 5 four-st'y brown-stone front dwells., tin roofs; cost, each, $29,000; owner, Geo. W. Hamilton, 408 West Seventy-first St.; architects, Thom & Wilson, done by day's work.

West Fiftieth St., Nos. 414 *and* 416, 2 five-st'y brick tenements, tin roofs; cost, $6,000 each; owner, Adolph Koschel, 153 Fourth Ave.

Fifty-seventh St., n s, 269′ w Sixth Ave., four-st'y brick and stone dwell., slate and metal roof; cost, $30,000; owner, Dr. G. Langmann, 151 West Forty-third St.; architect, Edward E. Raht; mason, Marc Eidlitz.

One Hundredth St., s s, 100′ w Tenth Ave., 7 four-st'y brick dwells., tin roofs; cost, each, $10,000; owners, Mrs. Annabella Koughran, 364 Lexington Ave., and Mary E. McCool; architect, John C. Burne.

One Hundred and Forty-third St., s s, 141′ 6″ e Willis Ave., 2 two-st'y frame dwells., tin roofs; cost, each, $3,000; owner, Fred. McCarthy, 634 East One Hundred and Forty-third St.; architect, H. S. Baker.

ALTERATIONS. — *Fourth Ave.*, s w cor. Sixty-second St., raised in portions one st'y, walls strengthened, and internal alterations, rear half of building rebuilt, etc.; cost, $100,000; owner, Edward Martin, Yonkers, as trustee New York Life Ins. Co.; architect, W. E. Worthen.

West Forty-seventh St., No. 206, extension to be raised one st'y, walls of front building rebuilt; cost, $5,000; owner, John Spannhake, 206 East Forty-seventh St.; architect, Adam Weber.

Ninth Ave., n e cor. Thirty-ninth St., one-st'y brick extension, tin roof; cost, $5,000; owners, trustees of the North Presbyterian Church, John Camerdon, treasurer, 334 West Twenty-ninth St.; architects, J. C. Cady & Co.; builders, Jas. H. Parker, and Wm. Mulgrew.

New St., No. 69, new store front in basement, and internal alterations; cost, $5,000; owner, Wm. Spencer, 111 East Sixty-ninth St.; architects, A. B. Ogden & Son; builders, David E. Herbert, and John C. Umberfield.

University Pl., s w cor. Eighth St., one-st'y brick extension, tin roof; cost, $4,000; lessee, John E. Cusick, 11 Avenue D; architect, John Brandt.

East Twenty-fifth St., No. 116, add one-st'y flat, tin roof; cost, $6,000; owner, John Smith, 114 East Twenty-fifth St.; architect and carpenter, C. F. Valentine; mason, E. A. Thorp.

Third Ave., n e cor. One Hundred and Forty-fifth St., 2 buildings, raise one-st'y and four-st'y frame extensions, tin roofs; cost, $4,000; owner, Elizabeth Fitzsimmons, 853 First Ave.; architect, Adolph Pfeiffer; builder, not selected.

Philadelphia.

BUILDING PERMITS. — *Adaline St.*, w of Seventeenth St., 2 two-st'y dwells., 16′ x 40′; R. B. Beath, owner.

North Delaware St., e of Twenty-second St., one-st'y factory, 22′ x 80′; Empire Dry Color Co., owners.

Fairhill St., cor. Cambria St., three-st'y dwell., 19′ x 52′; Jno. Sheabur, owner.

Twenty-fifth St., cor. Brown St., addition to church-building, 70′ x 80′; A. H. Williams, contractor.

Adams St., No. 1020, two-st'y dwell., 18′ x 36′; J. M. Buchanan.

Pennock St., s of Brown St., 3 two-st'y dwells., 14′ x 35′; Wm. Charlton, owner.

Thirty-second St., n of Chestnut St., 4 three-st'y dwells., 16′ x 45′; G. P. Bland, owner.

Almond St., n of Somerset St., two-st'y dwell., 18′ x 50′; A. McClay, contractor.

Ninth St., n of Columbia Ave., 5 two-st'y dwells., 16′ x 40′; H. Rookstool, owner.

Meadow St., w of Paul St., one-st'y planing mill, 40′ x 45′; Jas. Comly.

Carlisle St., cor. Columbia St., 6 three-st'y stores and dwells., one, 18′ x 65′; three, 17′ x 65′; two, 16′ 4″ x 65′; Thos. P. Turbill, owner.

Second St., n of Tioga St., 2 two-st'y dwells., 17′ x 45′; Wm. Lawrence.

Leiper St., s of Foulkrod St., three-st'y dwell., 16′ 8″ x 50′; Wilson Milnor, contractor.

Penn St., cor. Oxford St., three-st'y dwell., 34′ x 65′; Wilson Milnor, contractor.

Kirby Ave., n of Oak Lane, 2 three-st'y dwells., 16′ x 38′; R. J. Kirby, owner.

Indiana St., e of Eleventh St., two-st'y dwell., 16′ x 40′; Joseph Miller, contractor.

Germantown Ave., cor. of Miller St., two-st'y stone stable and shop, 20′ x 32′; J. K. Pierson, owner.

Locust St., n of Willow St., 2 three-st'y dwells., 13′ 8″ x 50′; Chas. D. Greeves, owner.

St. Louis.

BUILDING PERMITS. — C. Walter, 2 adjacent brick tenements; cost, $4,000; J. E. Truitt, contractor.

S. Marx, 3 adjacent brick tenements; cost, $3,000; O. Koenig, architect; Joe Weiss, contractor.

J. Fegschoff 5 adjacent brick stores and tenements; cost, $11,500; H. C. Brinkmeyer, contractor.

Conn. Mutual Life Ins. Co., five-st'y brick business houses; cost, $50,000; Charles E. Illsley, architect; F. C. Bonsack, contractor.

St. Louis Board of Public Schools, three-st'y school-house; cost, $13,900; Wilkemi, architect; M. Britt, contractor.

S. H. Hoffman, two-st'y frame dwell.; cost, $3,000; S. Hoffman, contractor.

Mary Landecker, two-st'y brick dwell.; cost, $3,450; Jno. Martzleff.

German Cumberland Presbyterian Church, two-st'y dwell.; cost, $3,600; J. Smiley, contractor.

Louis Hohlby, 3 adjacent two-st'y tenement-houses; cost, $3,500; sub-let.

Leo Magee, two-st'y dwell.; cost, $4,000; A. E. Cook, contractor.

Shaeffer Bros. & Powel, two-st'y warehouse; cost, $9,000; Nic Rissi, contractor.

Shaeffer Bros. & Powel, one-st'y boiler-house; cost, $4,000; Nic Rissi, contractor.

James Verdin, two-st'y dwell.; cost, $4,500; G. M. Theobold, contractor.

Jno. W. McCullough, two-st'y dwell.; cost, $6,000; J. McGrath, architect; N. Wickwire, contractor.

A. Koehm, two-st'y stores and tenements; cost, $4,800; Phil Tremann, architect; A. Beinke & Co., contractors.

General Notes.

ABBOTTSTOWN, PA. — Mr. Warren W. Hafer has commenced work on a brick house, to cost $15,000; drawings by J. A. Dempwolf, architect, York, Pa.

BELLOWS FALLS, VT. — The laying of the corner-stone and blessing the foundation of St. Charles Catholic Church was celebrated August 17.

BRYN MAWR, PA. — Country-house for J. R. Segee, Esq., first st'y Trenton brown-stone, second st'y tile, finished in hard wood; cost, about $12,000; plans by Hazlehurst & Huckel, architects, Philadelphia.

COLUMBIA, PA. — The School Trustees are building a two-st'y school-house in stone, pressed brick and terra-cotta; total cost, $15,000; architect, J. A. Dempwolf, York, Pa.

DARLINGTON, S. C. — The Darlington Hotel Company has been organized to build a hotel here.

EAST NEW YORK, N. Y. — The corner-stone of a new school-house was laid, August 9, at New Jersey and Fulton Aves. The building is to cost $10,000.

FALL RIVER, MASS. — The Baptist Church Society have voted to raise their church and make a vestry underneath it, at a cost of $1,600. Dr. Shurtleff, G. H. Melvin, and A. H. Hood were appointed a building committee.

HAMILTON, N. Y. — T. I. Lacey, of Binghamton, N. Y., is the architect of the new Theological Hall for Hamilton College. It will cost $50,000.

KANSAS CITY, MO. — R. J. Gillelen, business building on Union Ave., opposite Union Depot; cost, $4,500.

John H. Gow, business house at 909 and 911 State Line; cost, $5,000.

F. J. Hammer, house in Reid's addition; cost, $5,000.

J. D. Boyer, brick livery stable, at lot 216, block 15, McGee's addition; cost, $4,500.

Thomas S. Ridge, stone front brick business block, near the n e cor. of Twelfth and Main Sts.; cost, $12,000.

E. B. Griff, livery and store room, s w cor. Fifth St. and Grand Ave.; cost, $5,000.

Evangelical Association, wood chapel, n e cor. Nineteenth and High Sts.; cost, $2,000.

Coale Cracker Co., addition to factory at 206 Main St.; cost, $7,000.

GETTYSBURG, PA. — J. A. Dempwolf, architect, of York, Pa., has in hand the following work in this borough: —

Alteration of house of Mrs. McCammon; cost, about $3,500.

Alterations to Presbyterian Church; cost, $3,000.

Remodelling of Lutheran Church, including chapel and infant school-room; cost, $10,000, inclusive of new tower, the gift of Dr. Swope.

Mr. Dempwolf has also prepared designs for Memorial Episcopal Church at Gettysburg, at an estimated cost of $30,000.

HANOVER, PA. — Designs for new High School building, to cost $15,000, have been furnished by J. A. Dempwolf, architect, York, Pa., and accepted by the committee.

LITTLESTOWN, PA. — Mrs. A. S. Hinkle is building a brick house and store; cost, $4,500; architect, J. A. Dempwolf, York, Pa.

LYNCHBURG, VA. — Since last report the following houses have been let to contract: —

Corner Church and Seventh Sts., brick house, two-st'y, for Dr. Parsons; cost, $6,000; E. J. McCrossius, architect.

Between Main and Church Sts., on Ninth St., addition to "Lone Jack" Tobacco Works; cost, $6,500; R. C. Burkholder & Son, architects.

College Hill Ave., frame house, for Jas. Cleland; cost, $2,000; R. C. Burkholder & Son, architects.

Between Church and Court Sts., on Twelfth St., brick tobacco factory, for Miller & Hawkins; cost, $7,000.

Clay St., between Eleventh and Twelfth Sts., brick factory, four-st'y, for Miller & Hawkins; cost, $10,000.

Diamond Hill, Cabbell St., brick factory, five-st'y; cost, $8,000; for Hancock Bros. & Co.

MINNEAPOLIS, MINN. — John Kelly, two-st'y wooden double dwell., n s of Eighth Ave., n e, bet. Second and Third Sts.; cost, $3,500.

Augsberg Seminary, three-st'y wooden dormitory, w s Twenty-second Ave., bet. Seventh and Eighth Sts., s; cost, $5,000.

E. Tolefson, two-st'y wooden dwell., s Eleventh Ave. and Ninth St.; cost, $3,500.

E. Tolefson, two-st'y wooden dwell., Fifteenth Ave. and Fourteenth St., s; cost, $3,000.

Mrs. S. J. Williams, two-st'y wooden dwell., Stevens Ave., cor. South Fifteenth St.; cost, $4,000.

J. S. Bell, two-st'y brick-veneered dwell. and barn, s e cor. Park Ave. and Fourteenth St.; cost, dwell., $20,000; barn, $1,500.

Leland & Crocker, brick skating-rink, cor. South First Ave. and Sixth St.; cost, $19,500.

Mrs. Clara Gardener, two-st'y wooden stone-front dwell., s s Seventh St., between Eighth and Ninth Aves., s e; cost, $2,200.

J. S. Kingman, same kind of structure, n s of South Second Ave., between Franklin and Twenty-second Sts.; cost, $3,500.

City of Minneapolis, two-st'y brick engine-house, n s of Blaisdell Ave. and Twenty-eighth St.; cost, $9,154.

MONTCLAIR, N. J. — Plans are prepared for a large new house for Mr. Thomas Porter, of this place; cost, $30,000.

MT. HOLLY, N. J. — Burlington County Court-House to be remodelled and an addition added thereto (is to be fire-proof, to be of stone and brick), from plans by Hazlehurst & Huckel, architects, Philadelphia, Pa.

PIERRE, D. T. — Mr. Ernest Baillie is the architect of the new building for the Presbyterian College.

REDWOOD FALLS, MINN. — The Catholics are building a new church.

ROCHESTER, N. Y. — Work has just been commenced on the following buildings, Jas. G. Cutler being the architect: —

Baptist Church, cor. of Meigs St. and Park Ave.; to cost $30,000, built of red Medina stone; building to be 80′ x 89′, fronting on Meigs St.; Stranghen & Derendorf, contractors.

Frame dwelling-house on Meigs St., to cost $5,000, for Mr. Jno. F. Alden; W. I. Devendorf, contractor.

Frame dwelling-house on Nichols Park; cost, $4,000; E. E. Howell, Esq., owner; W. I. Devendorf, contractor.

Improvements to building on Franklin St.; cost, $4,000; Mr. H. O. Stevens, owner; Schnarr & Becker, contractors.

Remodelling dwelling on East Ave.; cost, $3,500; R. A. Sibley, Esq., owner; J. G. Wagner, contractor.

Improvements to house of A. G. Yates, Esq., on South Fitzhugh St., using red Medina stone, red slate, tile, etc.; cost, $18,000; J. B. Pike, contractor.

Frame dwelling-house on Alexander St., for Mrs. Judson; cost, $3,700; W. I. Devendorf, contractor.

It is expected that contracts for the new Government building on Fitzhugh St. will be let about the first of September.

ROCKVILLE, MD. — The new stone, brick and terra-cotta building for the Montgomery County National Bank is almost completed; J. A. Dempwolf, architect, York, Pa.; N. Weigle, builder, of the same city.

SPRINGFIELD, MASS. — The County Commissioners have discussed plans for the new jail, and decided to consult several well-known architects concerning the best methods of obtaining plans. There will probably be no public competition, as the Commissioners prefer to select some reliable man and give him charge of both plans and construction.

PROPOSALS.

LATHING AND PLASTERING.
[At Jackson, Miss.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., August 21, 1884.

Sealed proposals will be received at this office **until 2 P. M., on the 11th day of September, 1884,** for all the wire-cloth lathing and the plastering required in the court-house, post-office, etc., at Jackson, Miss., in accordance with drawings and specification, copies of which and any additional information may be had on application at this office or the office of the Superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

M. E. BELL,
454 Supervising Architect.

STEAM-HEATING APPARATUS.
[At Middletown, Conn.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., August 22, 1884.

Sealed proposals will be received at this office **until 2 P. M., on the 19th day of September, 1884,** for supplying and putting in place, complete, a low-pressure return-circulation steam-heating apparatus required for the custom-house, etc., at Middletown, Conn., in accordance with drawings and specification, copies of which and any additional information may be had on application at this office or the office of the custodian at the building.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

M. E. BELL,
454 Supervising Architect.

IRON-WORK.
[At Columbus, O.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., August 25, 1884.

Sealed proposals will be received at this office **until 2 P. M., on the 10th day of September, 1884,** for furnishing and putting in place, complete, the iron beams and columns required for the court-house, post-office, etc., building at Columbus, O., in accordance with drawings and specification, copies of which and any additional information may be had on application at this office or the office of the Superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

M. E. BELL,
454 Supervising Architect.

CITY-HALL.
[At Richmond, Va.]

CITY ENGINEER'S OFFICE,
RICHMOND, VA., August 16, 1884.

Sealed proposals are invited **until October 1 next, at 6 o'clock, P. M.,** for building a new city-hall at Richmond, Va.

Drawings, specifications, and printed forms can be seen at this office.

The Committee on Grounds and Buildings reserves the right to reject any and all bids.

For further information apply to the undersigned.

W. E. CUTSHAW,
457 City Engineer.

BREAKWATER.
[At Greenport, N. Y.]

ENGINEER OFFICE, U. S. ARMY,
11 INSURANCE BUILDING,
NEW HAVEN, CONN., August 8, 1884.

Sealed proposals for extending the Greenport breakwater will be received at this office **until 10 o'clock, A. M., on Monday, September 22, 1884.**

Proposals must be made in triplicate. Specifications, blank forms, and instructions to bidders may be had on application at this office.

WALTER McFARLAND,
455 Lt.-Col. of Engineers.

JOINER'S WORK AND WOOD-FLOORING.
[At Memphis, Tenn.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., August, 26, 1884.

Sealed proposals will be received at this office **until 2 P.M., on the 23d day of September, 1884,** for furnishing and fixing in place complete all the joiner's work and wood-flooring required for the custom-house and post-office building at Memphis, Tenn., in accordance with drawings and specification, copies of which may be seen, and any additional information obtained on application at this office, or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening, will not be considered.

M. E. BELL,
454 Supervising Architect.

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New Advertisements.

L. HABERSTROH & SON (Boston, Mass.), Decorations. Page iii.
W. C. YOUNG (Philadelphia, Pa.), Stained-Glass. Page xii.
J. S. THORN (Philadelphia, Pa.), Galvanized Iron. Page xv.

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PROPOSALS.

PAINTING, VARNISHING, AND BRONZING. [At Knoxville, Tenn.

OFFICE OF SUPERVISING ARCHITECT, TREASURY DEPARTMENT, WASHINGTON, D. C., August 14, 1884.

Sealed proposals will be received at this office **until 2 P. M., on the 4th day of September, 1884,** for all the painting, varnishing and bronzing, required for the custom-house and post-office, at Knoxville, Tenn., in accordance with specification, copies of which and any additional information may be obtained on application at this office or the office of the custodian at the building.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

M. E. BELL,
453 Supervising Architect.

MAIL ELEVATORS. [At New York, N. Y.]

OFFICE OF SUPERVISING ARCHITECT, TREASURY DEPARTMENT, WASHINGTON, D. C., August 14, 1884.

Sealed proposals will be received at this office **until 2 P. M., on the 4th day of September, 1884,** for furnishing and putting in place complete in the post-office and court-house building at New York, N. Y. Four (4) steam elevators in accordance with specification, copies of which, and any additional information may be had on application at this office, or the office of the superintendent of repairs.

Bids must be accompanied by a certified check, and those received after time of opening, will not be considered.

M. E. BELL,
453 Supervising Architect.

PROPOSALS.

DIKE. [Thames River, Conn.]

ENGINEER OFFICE, U. S. ARMY, 11 INSURANCE BUILDING, NEW HAVEN, CONN., August 11, 1884.

Sealed proposals for constructing a dike in Thames River, Conn., will be received at this office **until 10 o'clock, A. M., on Monday, September 22, 1884.**

Proposals must be made in triplicate. Specifications, blank forms and instructions to bidders may be had on application at this office.

WALTER McFARLAND,
455 Lt.-Col. of Engineers.

JETTY. [At Saybrook, Conn.]

ENGINEER OFFICE, U. S. ARMY, 11 INSURANCE BUILDING, NEW HAVEN, CONN., August 11, 1884.

Sealed proposals for extending the west jetty at Saybrook, Conn., will be received at this office **until 10 o'clock, A. M., on Monday, September 22, 1884.**

Proposals must be made in triplicate. Specifications, blank forms and instruction to bidders may be had on application at this office.

WALTER McFARLAND,
455 Lt.-Col. of Engineers.

SEWER. [At Avondale, O.]

CINCINNATI, August 16, 1884.

Sealed proposals will be received at the office of the undersigned, Room 23, Sinton Building, Fifth and Vine Streets, Cincinnati, O., **until 12 o'clock, M., of Saturday, the 13th day of September, A. D. 1884,** for construction of the main sewer and the necessary appurtenances thereto, in District No. 1, in accordance with plans of District No. 1, of the general sewerage plan of the incorporated village of Avondale, and according to the specifications on file in the office of the Board of Commissioners of Sewers.

The Council reserves the right to reject any or all bids.

Bidders will indorse their names and address upon the outside of the envelopes containing their bids.

Each bid to be accompanied by two disinterested sureties.

Bidders to use the printed forms, as none other will be received.

By order of the Village Council of Avondale.

W. ELLWOOD WYNNE,
453 Corporation Clerk.

STATE CAPITOL. [At Atlanta, Ga.]

New sealed proposals for the Georgia State Capitol Building are invited by the Capitol Commission **until September 24, 4 P. M. 1884.**

Plans, specifications, schedules and instruction to bidders may be had upon application to the Commission, in Atlanta, Ga., or to Edbrooke & Burnham, architects, 184 Dearborn St., Chicago, Ill.

Proposals may be submitted for the entire work, or for any classified portion, also for materials.

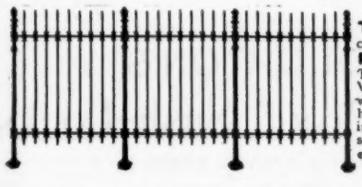
The Commission reserves the right to accept any bid, or to reject the whole.

No proposals will be considered unless made out on the schedules blanks.

All bidders will be required to furnish bond and security or a certified check (payable to the Chairman of the Board) equal in amount to five per cent of the bid submitted, as a guarantee to enter into contract with the Board should his bid be accepted.

Bids must be sealed and indorsed "Proposals for State Capitol Building," and addressed to the Board of Capitol Commissioners, Atlanta, Ga.

HENRY McDANIEL, Governor,
456 and Ex-Off. Ch'n Commission.



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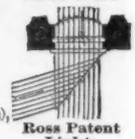

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PROPOSALS.

BREAKWATER. [At Buffalo, N. Y.]

U. S. ENGINEER OFFICE, BUFFALO, N. Y., August 14, 1884.

Sealed proposals, in triplicate, will be received at this office **until 11 o'clock, A. M.** (75th meridian time), **on the 13th day of September, 1884,** for the extension of the Buffalo Breakwater.

Specifications, blank forms, and instructions to bidders may be had on application at this office.

EDWARD MAGUIRE,
453 Captain of Engineers, U. S. A.

POST-OFFICE. [At Winnipeg, Man., B. N. A.]

DEPARTMENT OF PUBLIC WORKS, OTTAWA, August 9, 1884.

Sealed tenders, addressed to the undersigned and endorsed "Tender for Post-Office, etc., at Winnipeg, Man., will be received at this office **until Tuesday, the 2d September next, inclusively,** for the erection and completion of post-office, etc., at Winnipeg, Man.

Plans and specifications can be seen at the Department of Public Works, Ottawa and at the Dominion Clerk of Works Office, Winnipeg, on and after Monday, the 18th inst.

Persons tendering are notified that tenders will not be considered unless made on the printed forms supplied, and signed with their actual signatures.

Each tender must be accompanied by an accepted bank check, made payable to the order of the Honorable the Minister of Public Works, equal to five per cent of the amount of the tender, which will be forfeited if the party decline to enter into a contract when called upon to do so, or if he fail to complete the work contracted for. If the tender be not accepted the check will be returned.

The Department will not be bound to accept the lowest or any tender.

By order, F. H. ENNIS,
453 Secretary.

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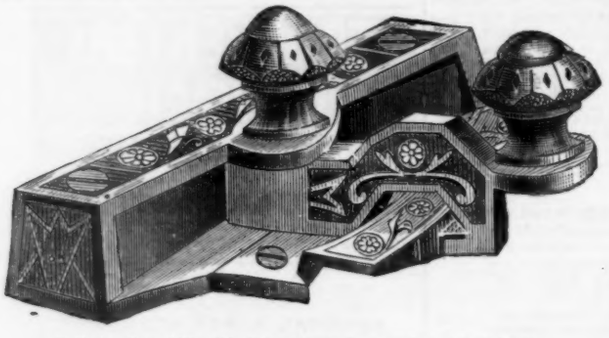

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PROPOSALS.

BREAKWATER.

[At New Haven, Conn.]

ENGINEER OFFICE, U. S. ARMY, NEW HAVEN, CONN., August 4, 1884.

Sealed proposals for the extension of the New Haven breakwater will be received at this office **until 10 o'clock,** A. M., **on Monday, September 8, 1884.**

Proposals must be made in triplicate.

Specifications, blank forms, and instructions to bidders may be had on application to this office.

WALTER McFARLAND,
453 Lt.-Col. of Engineers.

LABOR AND MATERIALS.

[At Jackson, Tenn.]

OFFICE OF SUPERVISING ARCHITECT, TREASURY DEPARTMENT, WASHINGTON, D. C., August 12, 1884.

Sealed proposals will be received at this office **until 2** P. M., **on the 9th day of September, 1884,** for furnishing all the labor and materials, stone, bricks, terra-cotta, wood-joists, roof framing, slate covering, etc., required for the basement and superstructure of the court-house and post-office building at Jackson, Tenn., in accordance with drawings and specification, copies of which and any additional information may be obtained on application at this office, or the office of the local superintendent of the building.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

M. E. BELL,
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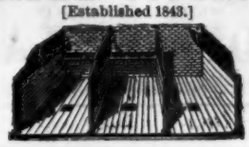

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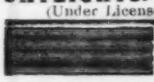
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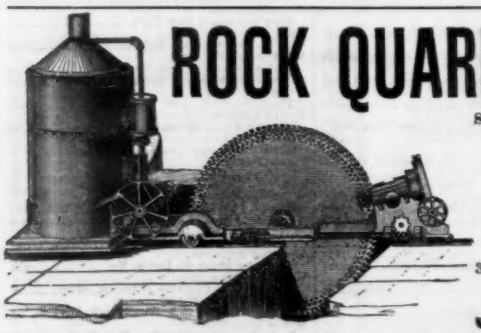
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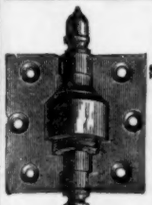

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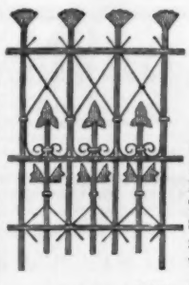

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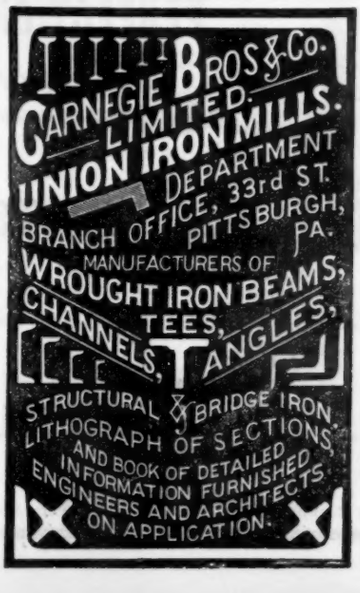

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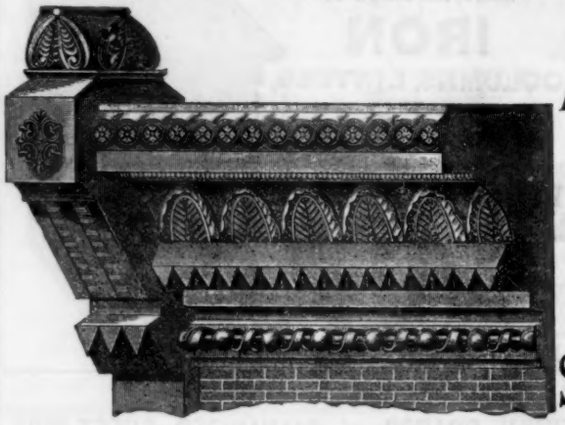

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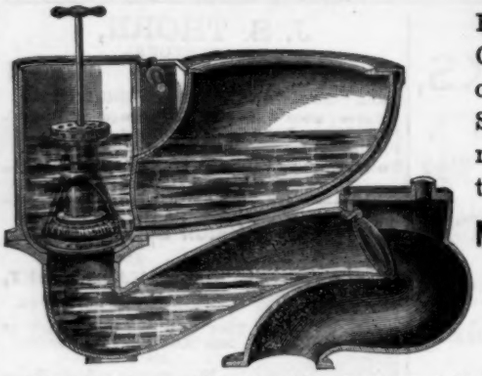

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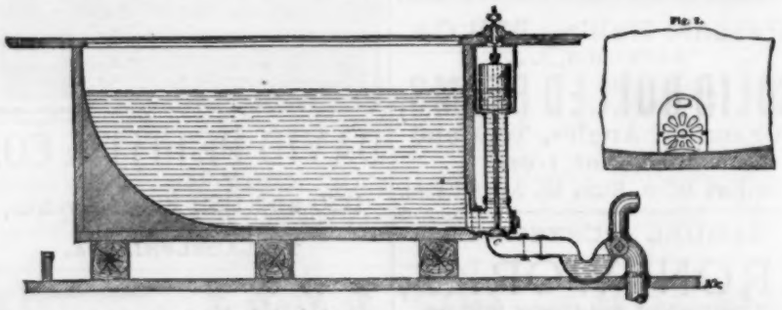

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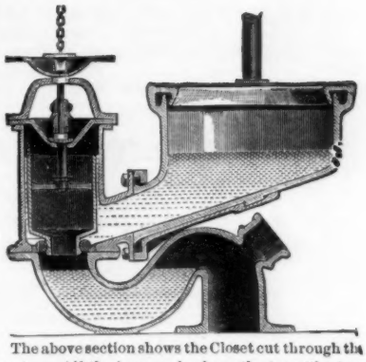

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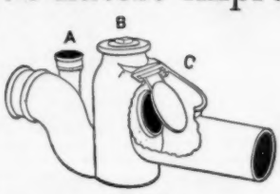

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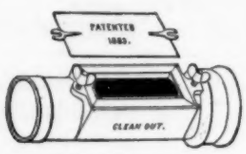

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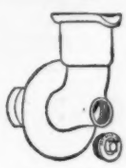

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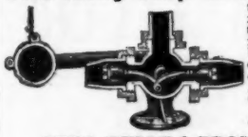

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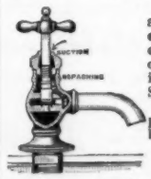

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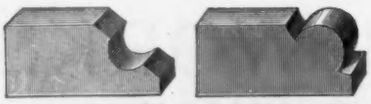

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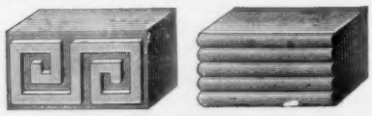

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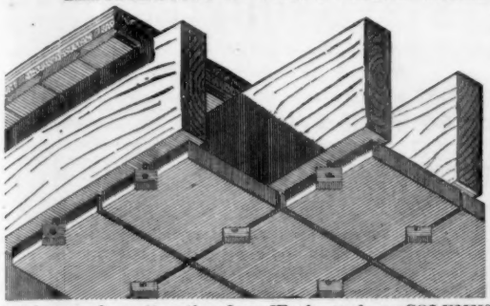

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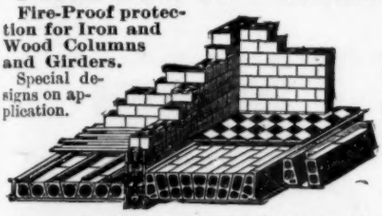

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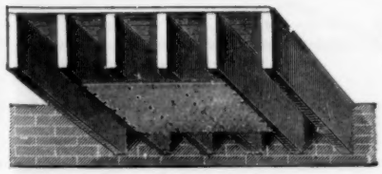

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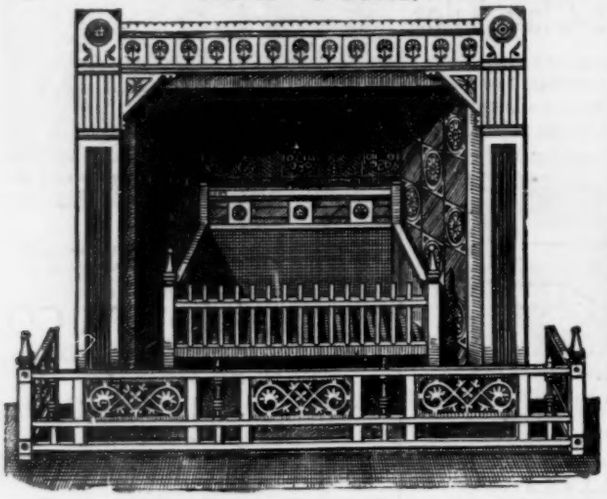

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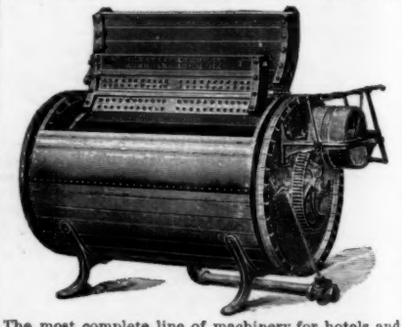

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